# Electrical Contracting

JANUARY
1935

SELLING is the big opportunity of the construction industry, not only electrical contractors but all elements of the industry.

Having been brought up to depend very largely on business brought to it, the industry must now sink or sell. The unemployment in the construction industry is the key log of this economic jam—to break it requires selling.

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# Get in on This Profitable Business

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## TRANSFORMERS

HERE is a profit-making type of equipment which is welcomed in industrial plants because it saves money.

These G-E air-cooled transformers provide a means for putting 115-volt power equipment such as small drills, compressors, fans, soldering irons, and gluepots on the higher-voltage power circuits. This means reduced operating expense, where the rate on these power circuits is lower.

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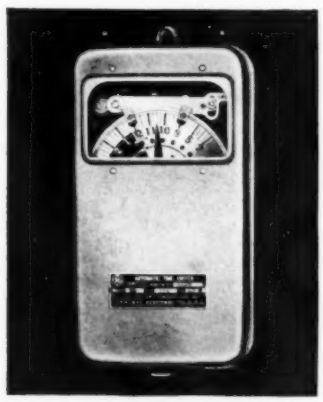

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Gentlemen:

Please send me descriptive and application data on the products I have checked above.

Name .....

Firm .....

Street .....

City .....

320-45

VOLUME 34
NUMBER 3

# electrical contracting

WITH WHICH IS CONSOLIDATED THE ELECTRAGIST and ELECTRICAL RECORD

S. B. WILLIAMS, Editor F. J. SEILER, Assistant Editor

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# 3 Whys

THE chief engineer for one of the largest utilities in the country once said that all he had to do was to answer the question "Why" three times. If his answers were satisfactory to his superiors the money was forthcoming and the project went ahead, otherwise not.

The first question that this engineer propounds is "Why do it?" The second is "Why do it this way?" and the third, "Why do it now?"

ALL of the creative selling of the electrical contractor is bound up in these three questions. If a contractor knows the answer to each question on a proposed job he should have little difficulty in selling the job.

To secure the answers, however, is another matter and that is where the hard part of creative selling comes in. It is assumed, that the type of work a contractor can initiate and sell is modernization, repairs, revamping and similar work of an engineering nature.

The first thing, of course, is to locate a building which should be overhauled electrically. This will probably involve a lot of door-to-door work, letters, etc. Once the prospect has been located it is necessary first to make a study of present conditions. From this study, if properly made, should come the answer to "Why do it?"

To save time and to quickly locate the defects and inefficiencies of the proposed job, it would be advisable to develop a standard survey. This might consist first of a rough layout of the present installation with circuit and feeder sizes together with the load characteristics; second, there should be prepared in advance a standard set of job questions, relative to power factor, light distribution, flexibility of control, age of job, special hazards such as explosion-proof, voltage drop, etc., etc. The answer to each of these questions will help to point the way to the answer to the second why.

This work can be done by foremen or other key men that the contractor wants to keep on the payroll. In fact, these men will, in all probability, be exceptionally keen to help their employer to secure the work and provide additional employment.

This preliminary plant survey should, upon analysis, show all of the problems. Now to present a solution thereby answering the question "Why do it this way?"

The contractor should be able to show the client more than one way in which to improve his electrical operation. Each of these plans would have certain advantages either of first cost, or last cost, or efficiency of operation flexibility, or, what not. In some plants one of these factors is more important than all of the others. The contractor should find that out and adapt his plan to fit the needs of the particular plant.

Thus we learn why a changeover should be made in a certain way rather than some other way. And this brings us to the final and probably the most important question "Why do it now?" The client may be convinced he should have the work done and that it should be done in a certain way but that is of no avail unless he can be made to see the necessity for having the work done now.

The answer to this question generally, although not always, is an economic one. Will it be profitable to have the work done now?

The contractor, therefore, in studying his survey and analysis must present a suggestion that will show lower costs of operation, or improved production, or lessened spoilage, or lessened employee lost time, or lower maintenance, or reduction of fire and life hazards, or some similar tangible advantage to the owner that can more than offset the cost of the changes.

THAT is the kind of selling that will produce handsome returns in 1935, or any other year for that matter. Because the contractor who makes the survey alone knows how to make the change there is little likelihood of the work being submitted to competition. The total volume might fall short of pre-depression years but the profit will be in line.



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9 YEARS OLD

GraybaR

66 YEARS IN BUSINESS

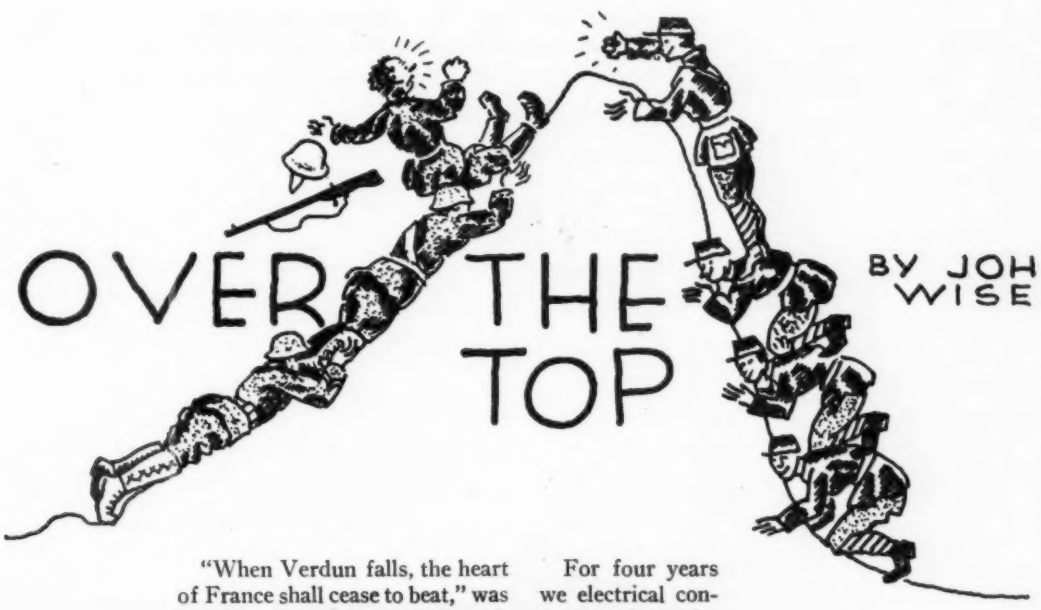
In 1869, Gray and Barton; in 1882, Western Electric Supply Department; since January 1, 1926, GRAYBAR

VOLUME 34
NUMBER 3

# electrical contracting

JANUARY
1935

WITH WHICH IS CONSOLIDATED THE ELECTRAGIST AND ELECTRICAL RECORD




"When Verdun falls, the heart of France shall cease to beat," was no chance war-time catchword, uttered to stir up temporary patriotism. Every Frenchman, from the President down to the lowliest trench-digging poilu, knew it to be the ghastly truth. Nor was their answer any idle boast. "They shall not pass!" said the army quietly, then made good with a defense that goes down as one of the finest examples of ingenuity and endurance in history.

For days, weeks and months, battered by superior forces, the flower of the French army took it on the chin. One by one the outer forts fell under the smashing blows of siege guns and furious attacks by one fresh army after another, pouring in like hounds to the kill. But, when even the most stubborn defenders were beaten back into the City of Verdun, when the nearness of the prize spurred the enemy to superhuman effort, the defense stiffened and held, never to break again.

Then came the turning-point. Wisely, the French knew that the enemy's powerful and sustained attacks had sapped his fighting strength. Just as wisely, they knew exactly the right moment to launch a great counter-attack. When the day of days arrived, a vast wave of horizon blue, bristling with bayonets, poured from the cellars of Verdun, and, in a few epic hours, took back all the ground gained by the enemy in eight weary months.

For four years we electrical contractors have defended ourselves against a siege as threatening to our existence as that of Verdun was to the French. Like them we have shown the wall-eyed World we can take it, and, like them, we cannot just hold the line, but must counter-attack to make victory certain. A New Year has dawned, a year of fulfillment, not promises, of many opportunities for each,—a year of the old-time hustle and bustle, to the music of roaring trucks, clattering hammers and clanking pipe.

This is our cue to be up and at 'em right now, battling, not with our backs to the wall for mere existence, but strictly on the offensive, getting back what is ours and more with it. We can fight hard and cheerfully this year, because our proposals will fall on more willing ears. Results from sales work will again be in proportion to the amount of effort expended.

Contractors, the hour has struck! Our line, with that of our Allies, the wholesaler and manufacturer, stretches solid and unbroken from sea to sea. Punch-drunk and staggering, Old Man Depression is on his last pegs, guard down and wide open for the knock-out. Let's pull up our socks and smack the big bum over.

*That's the Spirit of '35!*



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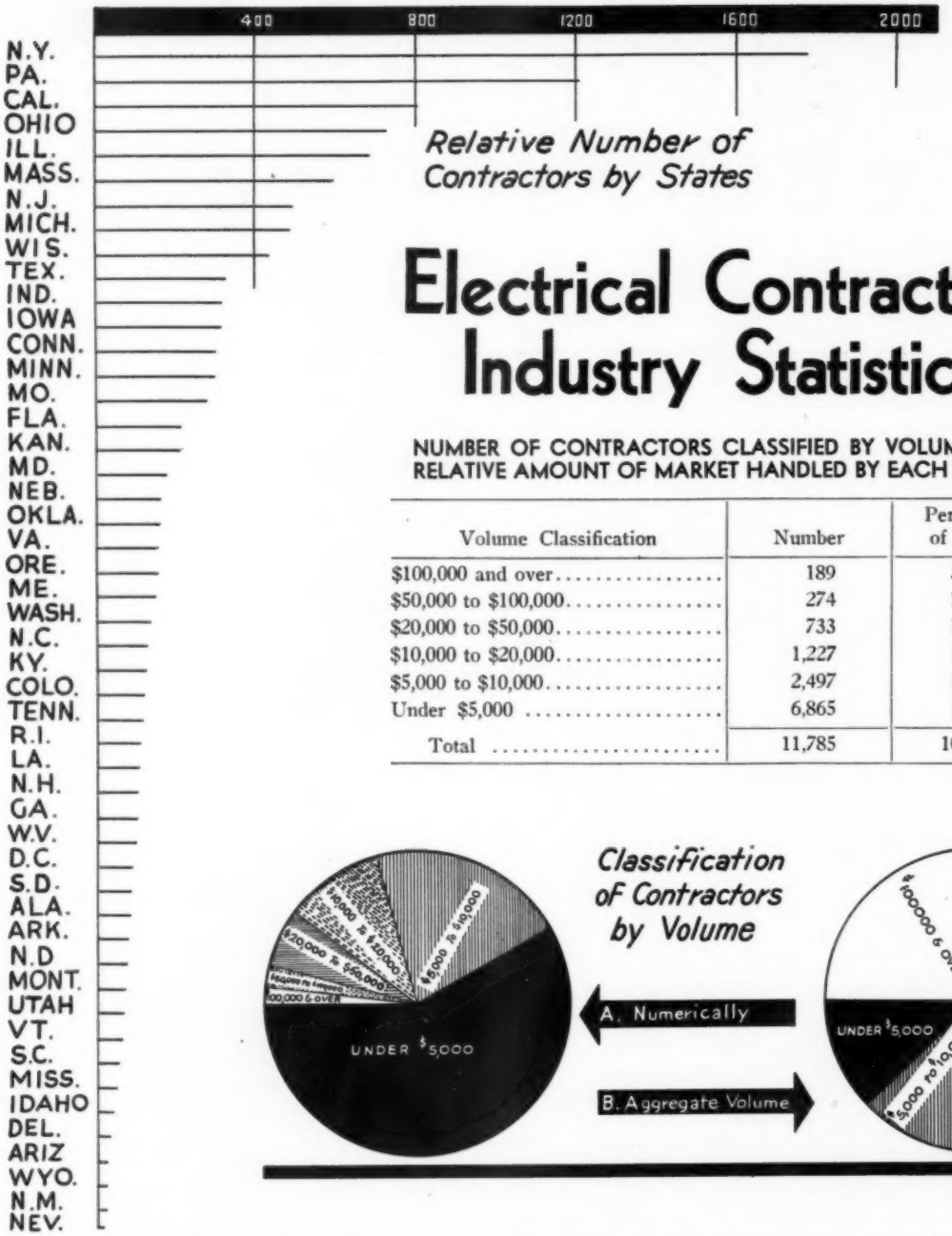


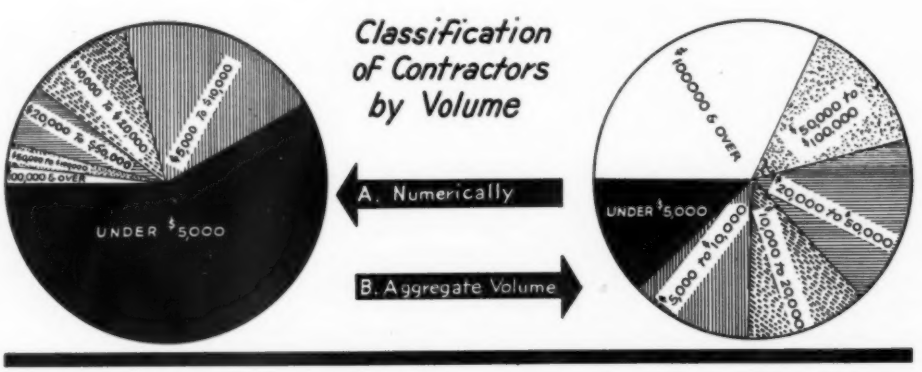

*Relative Number of Contractors by States*

# Electrical Contracting Industry Statistics

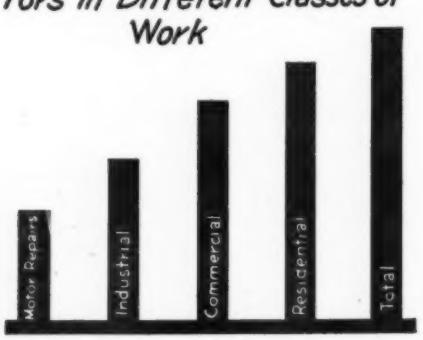
**NUMBER OF CONTRACTORS CLASSIFIED BY VOLUME AND RELATIVE AMOUNT OF MARKET HANDLED BY EACH GROUP**

| Volume Classification | Number | Percentage of Market |
|---|---|---|
| $100,000 and over | 189 | 32.0% |
| $50,000 to $100,000 | 274 | 13.9 |
| $20,000 to $50,000 | 733 | 17.5 |
| $10,000 to $20,000 | 1,227 | 12.4 |
| $5,000 to $10,000 | 2,497 | 12.6 |
| Under $5,000 | 6,865 | 11.6 |
| Total | 11,785 | 100.0% |

*Classification of Contractors by Volume*




*Relative Number of Contractors in Different Classes of Work*




**CLASSIFICATION BY CHARACTER OF WORK TO VOLUME OF BUSINESS**

| Volume Classification | Residential | Commercial | Industrial | Motor Repairs |
|---|---|---|---|---|
| $100,000 and over | 102 | 175 | 182 | 75 |
| $50,000 to $100,000 | 169 | 252 | 258 | 141 |
| $20,000 to $50,000 | 426 | 664 | 651 | 343 |
| $10,000 to $20,000 | 1,018 | 1,121 | 1,000 | 574 |
| $5,000 to $10,000 | 2,238 | 2,157 | 1,701 | 1,142 |
| Under $5,000 | 6,509 | 4,804 | 2,844 | 2,651 |
| | 10,462 | 9,173 | 6,636 | 4,926 |
| Percentage of total Number of Contractors | 89.4% | 78.5% | 56.6% | 42.1% |



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## WHERE IS THE CONTRACTOR'S PLACE OF BUSINESS

| Volume Classification | Store | Office | Home | Store and Office | Shop | Office and Home | Store and Home | Store, Office and Home |
|---|---|---|---|---|---|---|---|---|
| $100,000 and over | 29 | 122 | 5 | 29 | 1 | .. | .. | .. |
| $50,000 to $100,000 | 121 | 112 | 2 | 33 | .. | .. | .. | 1 |
| $20,000 to $50,000 | 408 | 214 | 35 | 48 | 5 | 4 | .. | 1 |
| $10,000 to $20,000 | 726 | 255 | 110 | 84 | 13 | 25 | 5 | 3 |
| $5,000 to $10,000 | 1,383 | 311 | 580 | 99 | 15 | 50 | 30 | 5 |
| Under $5,000 | 2,712 | 487 | 3,141 | 104 | 88 | 85 | 56 | 9 |
| Total | 5,379 | 1,511 | 3.873 | 397 | 122 | 164 | 91 | 19 |

DURING the past six months ELECTRICAL CONTRACTING has been gathering and compiling the statistics found on these two pages. While they are not complete they do represent such a very large percentage of the total volume of business done by the industry as to make them of considerable comparative value.

This is the first time that a broad survey of this character has been made covering as nearly as possible the entire electrical construction industry. It is presented in the hopes that with this true economic picture of the industry it may be possible to improve the position of the industry in distribution and marketing of electrical and allied products.

Certain facts stand out. The contractors doing $10,000 a year and over represent only 20 percent of the total number of contractors, yet their aggregate volume is 75 percent of the total. The contractors doing less than $5,000 worth of business last year represent nearly 60 percent of the total number of contractors yet their total volume is less than 12 percent of the aggregate for the industry. When considering sales and distribution costs these figures are significant.

Ordinarily we do not think of large contractors as doing residential work and yet the figures indicate that residential work is important in all volume classifications. The spread of industrial work is also very interesting, showing that even this class of work is not confined to any particular group. While all of this number do not specialize in industrial work they do enough of it to make themselves a factor worth considering in any sales plan.

It is also interesting to note that nearly 50 percent of the electrical contractors do motor repairing. In many cases they probably confine their efforts to minor repairs, but even so the number of contractors doing this work is larger than supposed.

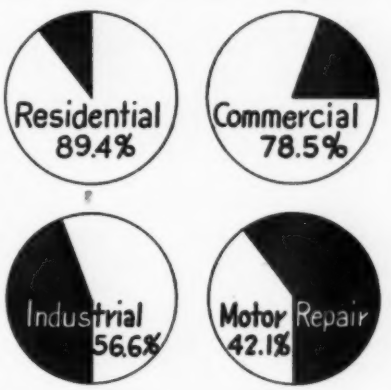
The figures show that approximately 50 percent of the electrical contractors are also dealers having a store as their place of business. The number doing work out of their home is not large except for the group doing less than $5,000 worth of work a year. Even the character of work seems to have little effect, on the whole, upon the place of business.

It has generally been supposed that the contracting business had a tremendous mortality. This was probably true of those in the very smallest groups before the depression. The depression apparently has left the more stable contractors in business. The figures as presented show that even in the under $5,000 group, more than 60 percent have been in business 10 years or more.

It was apparent from the study of these figures that the contracting business must be considered very largely in relation to the volume of business. The contractors doing from 80 to 90 per cent of the total volume of business present a picture of stability that is quite contrary to the general conception. Distribution programs based upon this fact should be more likely to succeed and should be less expensive to operate than programs based upon the complete coverage of the entire market.

It must furthermore be remembered that these figures represent the economic status of an industry after five years of depression, during the last two of which the construction market had almost reached the vanishing point. In most instances the contractors in any of these volume groups would in a normal year be placed in a higher group with even those in the lowest group doing a fairly nice volume of business.

*Percentage of Contractors Doing Certain Class of Work*




## AVERAGE NUMBER OF YEARS IN BUSINESS

| | |
|---|---|
| $100,000 and over | 22.7 |
| $50,000 to $100,000 | 20.6 |
| $20,000 to $50,000 | 18.1 |
| $10,000 to $20,000 | 16.6 |
| $5,000 to $10,000 | 13.7 |
| Under $5,000 | 12.8 |

## PERCENTAGE OF CONTRACTORS IN BUSINESS 10 YEARS AND OVER

| | |
|---|---|
| $100,000 and over | 89.6 |
| $50,000 to $100,000 | 93.0 |
| $20,000 to $50,000 | 86.8 |
| $10,000 to $20,000 | 81.8 |
| $5,000 to $10,000 | 71.5 |
| Under $5,0000 | 62.9 |

## RELATION OF CHARACTER OF WORK TO PLACE OF BUSINESS

| Class of Work | Store | Office | Home | Shop |
|---|---|---|---|---|
| Residential | 5,316 | 1,546 | 3,935 | 146 |
| Commercial | 4,790 | 1,748 | 2,747 | 147 |
| Industrial | 3,424 | 1,545 | 1,881 | 131 |



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# 1935?

WHAT is the outlook for the electrical construction industry for 1935?

In preparation for this article the editors of ELECTRICAL CONTRACTING wrote to the chairmen of each of the twelve Code regions asking for their opinion. Probably nobody is closer to the industry than these regional chairmen in their own regions. For that reason their reports are based upon actual facts without speculation.

Except for Florida and Louisiana the reports are very largely of the same general tenor. An improvement is expected but not large. Government work, alterations, modernization and residential construction are looked upon as the best channels for improvement in 1935.

In the east no improvement except of a minor nature is expected in 1935. Some endowed institutional building, some government work including F.H.A. construction and modernization are the only new work expected.

The south, on the other hand, with the exception of a few areas is expecting a substantial improvement over 1935. This, in some respects, is due to the fact that 1934 in many southern areas was exceptionally poor. Already a number of privately financed projects are in negotiation in one large city, the aggregate of which is greater than the entire 1934 building program in that city.

### Florida Booming

Florida in the second half of 1934 issued more building permits than in the previous two years combined, while from plans on the boards and new work contemplated Florida will enjoy in 1935 one of the most prosperous years since the former boom in that state.

Louisiana's construction in 1934 went ahead of 1933 and 1932 and the predictions are that 1935 will be at least 50 percent better than 1934.

Throughout the central region there is the feeling that 1935 will be better than 1934.

In the southwest the industrial and commercial work is expected to be about the same as 1934 while residential is expected to increase.

The California and mountain district did better in 1934 than in 1933 and expects to improve steadily in 1935.

No improvement is indicated in the northwest, at least for the first half of 1935 except in the mining regions. Higher prices for metals are making it profitable to reopen a number of old mining properties.

No large amount of big building construction of a private nature, either commercial or industrial, unless monumental buildings of a non-profit nature, as one man put it, is anticipated prior to the middle of the year, while most regional chairmen put big construction even further away than that.

Some chairmen mentioned F.H.A. activities as one of the assets of 1935, but more particularly in the new house construction market.

As contrary to the above lack of enthusiasm is the early December news announcing large building programs of important manufacturing and utility companies. It was estimated that the announced new construction and modernization programs of industry would equal $1,000,000,000 by the start of the New Year.

In addition, there is the increasing attention being paid by government, business men, bankers and economists to the construction industry as the key log in this economic jam. It is now clearly recognized that the serious unemployment is in the heavy industries and until their condition is improved little improvement can be made in the general situation. Something of benefit to the construction industry is bound to result from such a condition.

Likewise, the federal government has made it very plain that it cannot retire from its role of providing employment and thereby piling up the national debt, unless industry reemploys the idle workers. There is reason to believe that many industrial and financial leaders have reached the conclusion that there is nothing to be gained by governmental expenditures and that real relief can be secured only by expansion.

The foregoing presents a picture of 1935 only so far as business that comes to us is concerned. It is agreeable to note that a growing number of contractors are no longer willing to wait for something to happen but are out digging up work, particularly selling modernization. There is every reason to believe that contractors who will follow this line will find that 1935, while perhaps not as large in volume as 1929, will be exceptionally kind in the matter of profit.

### Cooperative Possibilities

Other points of interest in 1935 business are an anticipated peak year for range wiring, greater cooperation between contractors and their local light companies in the creation and development of new load provided the federal government is less antagonistic to the utilities, the introduction of new materials especially designed to solve the problem of adequate rewiring of already wired houses, cooperative market development campaigns on the part of competing manufacturers, the further development of the air-conditioning market.

These, of course, are all optimistic in character. Opposed to them are strong pessimistic signs, the strongest of which is the unwillingness of people generally to give up the pessimistic position and actually see the progress that is being made. Also the lending institutions are not yet overjoyed at the prospect of financing a building operation.

Nevertheless, there was improvement in 1934 in the electrical construction business and 1935 from this position looks better than 1934. How much better cannot even be intelligently guessed. It might come slowly and then again there is the possibility, remote as it may now seem, that new construction might come so fast as to bring about a shortage of labor in certain classes of construction work.



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# What Has the Code Accomplished And What Are its Prospects for 1935

By L. E. MAYER, Chairman
Electrical Contractor's Code Authority

THE beginning of the year is an appropriate time to take stock of what has been accomplished by the Code Authority for the Electrical Construction Industry and to give some consideration to our plans for the future. The Code for the Electrical Construction Industry has been in effect for eight months. It has not accomplished all that the industry hoped it would accomplish, and as we reflect back, it is doubtful if any code and any degree of administration thereof could have done what we all so eagerly desire. That we have made progress, however, is undeniable and that we have made this progress in a short period of eight months during which all of the code administrative forces had to be set up and the personnel of these forces, untrained in code matters, had to get their education, mostly from a distance, should be most encouraging to us as we look forward to the operations of the code in the New Year.

Your Code Authority was very largely organized prior to the signing of the code by the President in order not to lose any time in the administration of the code. Promptly upon the signing of the code by the President the code authority organization was completed and measures taken to develop local administration. With a desire for economy and effectiveness the country was divided into twelve regional areas which were defined very largely along market trading area lines. The ten members of the Code Authority, seven of whom are members of the N.E.C.A. and three of whom are non-members, were each appointed as directors of a region. This left two regions to which non-code authority members were appointed as chairmen. Each of these twelve regional chairmen have had the heavy responsibility of setting up districts within their region, and with the cooperation of the chairmen of these districts, securing the appointment of the local administrative committees. Because so much of the responsibility for securing code compliance and adjusting the many complaints between members of the industry falls upon these local bodies, it was necessary that these regional and district chairmen devote the greater part of their time to this organization work during the summer and early fall months, and in my opinion, the electrical contracting industry should congratulate itself upon the code organization job that it has accomplished, and particularly upon the personnel of the administrative committees.

At the present time there are approximately 350 local administrative bodies operating for the electrical construction industry. Setting up of such a large number of committees and starting them functioning was alone a tremendous task to be performed in so short a time. Unfortunately, however, we should have more local administrative committees and the nearer this number approaches the 500 mark, the nearer will we be to performing our function of covering all sections of the country with local administration.

It is not easy to find chairmen and members for these local bodies who

L. E. Mayer



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not only can give the time, but who have that necessary judicial characteristic of viewing everything brought to them in an impartial and unbiased manner. So far we have been unusually successful in securing this type of man and it is particularly gratifying to the Code Authority to see the enthusiastic and unselfish manner in which these local administrative bodies have approached their task.

### Compliance

The most important phase, of course, of the work of the local administrative committees is to secure compliance. A study made by the Code Authority of all complaints coming to local committees brought forth the amazing fact that 81 per cent of all complaints have been adjusted by the local bodies without recourse to the Code Authority or to NRA compliance boards. Surely that in itself is worth all of the time and effort spent in code work. That there have been some disappointments is natural. The administration of the code is not perfect, nor will it ever be. Moreover, the cooperation of NRA compliance boards and government bureaus has not been all that it should be. Nevertheless the amount of compliance that has been secured has been very salutary in securing further compliance from potential violators.

The greatest difficulty that we have faced nationally and locally in securing compliance has been from the government itself, both through the compliance division and the government spending bodies engaged in construction programs. Conflicting conditions have arisen and contrary rules have been made, but your Code Authority is of the opinion that this situation is being corrected and that the results in the coming year will be much improved.

It is not only the electrical contracting industry that has suffered in this connection. Every branch of the construction industry reports similar conditions. At a meeting of the Construction Council and of the Construction Code Authority held in Knoxville early in December the industry went on record as condemning these contrary rulings by government spending agencies and urging upon the government greater enforcement of the codes which the government has given to industry.

These codes came to industry so quickly that the machinery for compliance was totally inadequate. It has taken time to build up methods of compliance and to secure the right machinery. Apparently this could be found only through the process of trial and error and now we are informed that NRA will set up a decentralized compliance organization which will have for its purpose the speeding up of compliance decisions. We have been reliably informed that it will be the purpose of the new NRA localized compliance organization to work with the code administrative bodies to secure compliance not only with the labor provisions of the codes, but with the trade practice provisions and the assessment provisions.

In comparing notes with Code Authorities in other divisions of the construction industry it has been gratifying for us to note that the Electrical Construction Code has functioned with more force and effect than any other divisional code in the construction industry. This has been due, as has been stated before, very largely to the unselfish and the interested personnel of our local administrative forces.

### Financing

A further problem that has been exceptionally pressing has been that of financing. In an industry of 20,000 or more names enrolled, it has been very costly to send out the required literature and forms and assessment notices, etc. The cost of organization has also been expensive. An organization had to be set up to take care of the thousand and one details. We had set up a budget originally which would cover all of these expenses and allocate to the twelve regions money for further developing contact. Unfortunately, the funds from assessments have not equaled the budget and we have been forced to curtail our expenditures almost 70 per cent. Salaries have been trimmed and all costs cut so that today our current operations are within current receipts. We should have a larger amount of money to do the larger job that is before us, but your Code Authority, as business men, felt that it should first balance its budget and operate within the amount of its receipts. For that reason we have perhaps not accomplished all that we might have accomplished, but as additional funds become available we can do more promotional work.

Some of our local administrative committees have been greatly discouraged because of the lack of money. We have asked for some assistance in this direction through the readjustment of the amount allowed for registration of contracts from one-tenth of one per cent to four-tenths of one per cent. We are hopeful that this, together with the local filing fees, may adjust the local financial situation. That the local committees have functioned so well in spite of the lack of funds and in spite of the fact that they frequently have had to finance themselves, is, to our way of thinking, a fine tribute to their loyalty to the industry.

### N.E.C.A. Sponsorship

One of the important matters now confronting us is the relationship between your Code Authority and the National Electrical Contractors Association from the standpoint of the requirements of National Electrical Contractors Association membership in local administrative committees. We must not lose sight of the fact that the N.E.C.A. is the sponsor group. Were it not for the association we would not have had a code. Not only did it finance the activities necessary to securing a code, but it has also financed all of the deficits of the Code Authority.

Had it not been for the National Electrical Contractors Association your Code Authority would not have had the money with which to organize the industry and administer the code. It is quite essential, therefore, that the membership in the National Electrical Contractors Association be maintained at the highest possible point, that the strength of its sponsorship may be as great as possible.

The Code Authority has observed that since the enforcement of the code there has been a marked improvement in competitive bidding and business practices within the electrical construction industry. This is important to our industry and is a situation which must be maintained. We should, therefore, all of us encourage the administration in Washington to allow us to continue with a code of fair competition in order that our industry may as conditions in the building industry improve regain its status of a profitable business.



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(left) One of 55 column distribution centers for the control of show-case and special decorative effects. A show-case feeder cord is plugged into the receptacle at the bottom of panel trim. Fixed connections are run from this panel to column outlets, for decorative lighting. Each of four circuits is switched and protected by an individual breaker.

(middle) A group of lead covered feeders for the window and marquise were installed in a trench which also encased the main service cables. This routing permitted large feeder capacities to be brought near a new control panel without exposing large conduits in the sales areas. Splices permit smaller conductors and conduits to be run in a small space.

(right) By careful planning this new feeder system and rear-of-board remodeling was done without interrupting service. The entire section of switchboard shown is a new addition which is required to meet modern demands.

# Rewiring A Large Occupied Department Store

PLANNING and executing a modern wiring installation in a large department store to avoid interruption to the busy sales areas is a supreme test of engineering design, management of crews and judgment of time factors. Such a job is now nearing completion by the Martien Electric Company of Cleveland, Ohio, for Taylor's downtown store. Involving a peak crew of 104 men on one shift, with continuous three-shift operations, about 60 percent of this $60,000 rewiring job was done in 11 days. A two weeks' payroll of $15,800 resulted from this massed production schedule at the peak period.

The rewiring operations extended from the basement of this establishment up to portions of the fourth floor. All of this involved the procurement of a wide range of materials and the proper tools for the scattered crews, with detailed advance planning to insure prompt completion, once a particular part of the work was commenced.

### Some Job Problems

This job involved a remodeled underground main feeder system and main switchboard, 99 special panelboards and new sub-feeders, and about 865 branch lighting circuits to a new system of lighting and control. All of this work was planned so as to permit the store to continue its normal business except for small areas that were shut down for replacing cabinets and for decorations.

Coupled with this responsibility was also the problem of conforming to a work-sharing plan for electricians that permitted a maximum pay of 20 hours per week, or 40 consecutive hours' pay in one week, with the following week on the layoff list. Thus those men engaged for overtime (for which double time was paid) actually worked 20 hours (at double) being then automatically replaced by new men until after two weeks had expired.

Crowded department stores provide very little space for workrooms. Therefore, a light court was converted into a shanty, by providing a temporary roof and the necessary stock bins, tool racks and work benches. Large pipe threading, bending, etc., had to be done at this remote base of operations. All standard quantities of material were first concentrated at this point for subsequent redistribution to the specific needs of each part of the job under production. Likewise, salvaged materials were brought back to this point for later re-use if possible, since there was no storage space in any finished area.

### Engineering Details

To increase the capacity of the main feeders involved a new underground trench in the basement floor, so as to save cluttering the basement



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ceiling with large conduits. The final installation provided four 1,000,000 c.m. new and three 2,000,000 c.m. old conductors for each outer leg of the 115/230 volt d.c. system. After the new cables were in place and in operation, the old cables were removed from the basement ceiling and reinstalled underground also, to the improvement of basement ceiling appearances. A new 5-panel wing was added at right angles to one end of the old main switchboard. This included the replacement of inadequate main switchgear with five 1500 amp. s.p. link fused, multiple-bussed switches for each outer main pole, and the reinforcement of the existing rear bus structure laminations. All of the foregoing operations were done under store operating conditions.

Because of size the new panelboard feeders had to be arranged in multiple conduit runs to meet space limitations at various crowded floors or partitions. Likewise the design of panelboards and their conduit connecting details involved special consideration (1) to permit cutovers from existing systems, (2) to meet space conditions, (3) to provide control in predetermined groups, (4) to meet future special decorative demands.

Magnetic switches or contactors of the 2-circuit, latch-in type of control were employed extensively for sectionalized panelboard groups. The window control panel, as an example, comprises the following controls:

Windows—72 circuits, 2 contactors.
Spots and recep.—18 circuits, 1 contactor.
Ornamental pylons—13 circuits, 1 contactor.
Entrances—40 circuits, 2 contactors (high and low intensity).
Marquise—28 circuits, 2 contactors (1-face; 1-soffitt).

The show-cases are of the island type, in connection with columns about the main sales floor. Wiring connections could not be made to these cases through the existing marble finished floor, as cutting was not permitted. Therefore, a local distribution center was designed for each of 55 columns, to be fed from the floor below by conduit stubbed up in the column furring. From each such distribution cabinet a plug connection was made to the base of the cases from a flush receptacle on the trim of the cabinet. Cases were interconnected with flexible jumpers equipped with male and female attachments so connected as to prevent a loose jumper having "hot" exposed male prongs.

Each of the 55 show-case distribution cabinets consisted of four 15-amp. automatic circuit breakers and two flush trim-mounted duplex receptacles, mounted in a metal cabinet 3½ in. wide, 20 in. high and 7 in. deep, to meet the conditions of case design. Rear connections were made within the 7 in. depth from a conduit stubbed up from the basement ceiling common feeder.

A network of exposed conduit subfeeders was installed on the basement ceiling from break-up panels housed in the basement cases. Each of these subfeeders consisted of three No. 1 wires in 1½ in. conduit and served as a common feeder for one or more of the 55 show-case distribution units, depending upon the estimated voltage drop to result from the longer runs. With the facilities thus provided, the main sales floor is equipped with adequate connections at all column centers for normal and extra holiday requirements, with local circuit breaker protection.

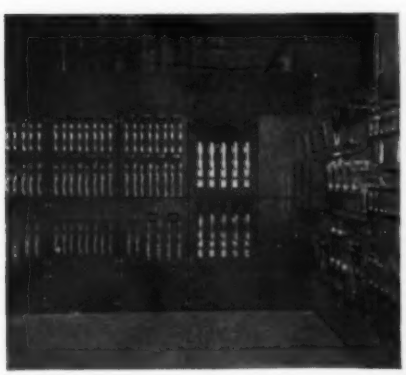
### Overhead Lighting

An extensive installation of precast indirect trough-lighted units of rectangular pattern were mounted against the main ceilings. Since these units occurred in bay centers, thus replacing the previous center-of-bay fixtures, it was possible to replace the existing wire, and employ the original conduit system. Local conduit alterations were confined to the space concealed by these new fixture units.

### Supervision

The manning of this job as previously stated, called for a general foreman of sufficient endurance to work through long periods of sleepless operations, so as to keep from four to six sub-foremen properly instructed at all times. Each sub-foreman in turn was equally beset with not only the physical job problem but that of instructing the frequent changeover of new personnel. ____

REINSPECTION briefs—Chicago's inspection department employs their defective wiring "cutoff" system so effectively that it is claimed contractors frequently report the correction of defects on the same day that "cutoff" is made. Wholly or partially defective branch circuits are sealed out of service under this six months old system, thus avoiding the need for utility service disconnection routine, and also minimizing customer inconvenience.



(left) The remodeled switchboard, showing a new 5-panel addition at left, joining the old board at right angles. (middle) The upper portion of marquise and window control panelboard.

All 171 branch circuits were collected above in a special raceway.
(right) A group of exposed lighting feeder conduits on the basement ceiling.



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# The Shop Make-Up of 4,000 Conduit Outlets

A partial view of the basement ceiling concrete form, showing several groups of 10-watt skylight outlet boxes in place.

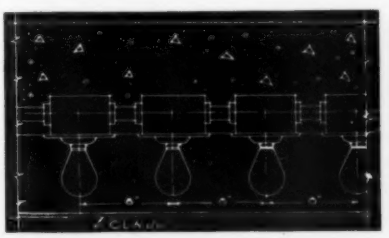
THERE are numerous large jobs of record where the branch conduit runs were cut up and bent to fit, in advance of installation, at some central point on the job. In wiring the Columbia Memorial Mausoleum at Vancouver, Wash., however, conduit was threaded, outlet boxes were ganged thereto, and bundles of this ready-to-install material were hauled to the job when the concrete forms were made ready to receive them.

In the wiring layout for this building, the Classen Electric Company of Vancouver was required to install approximately 4,000 conduit outlets in concrete floor slabs to provide flush ceiling receptacle outlets for 10-watt lamps to be used in connection with a series of artificial skylighting panels. The character of lighting, as well as the fixed type of wiring installation adopted in this layout, resulted from certain structural limitations which are to be briefly described later on in this article. These outlets occurred in rectangular groups comprising as high as 288 outlets. All groups employed a typical spacing of 8 in. centers between outlets, and between rows of outlets. Due to the low wattage value per outlet, the largest group of 288 outlets only required three branch circuits, thus greatly simplifying the connecting conduit sizes and arrangement for each group. The layout called for three circuits in 1 in., two circuits in ¾ in. and one circuit in ½ in. conduit.

The 8 in. spacing of outlets permitted nipples to be used for all box interconnections. These were all made approximately 4½ in. long for the three sizes needed, both for rows of outlets and for the cross-connection of outlet rows. The 2⅛ in. deep outlet boxes which were specified for this work were selected with their correct knockouts by means of the conduit connecting layout. This cut down the reaming out of knockouts for larger nipple sizes in nearly all cases. Solid back boxes were used except for those outlets which were located at junctions or branch-offs to adjacent outlet rows. These latter outlets employed removable back concrete boxes.

Each row of outlet boxes was assembled at the shop in nippled-up gangs, complete to its junction outlet. These assemblies were then bundled up and tagged, ready for use when the concrete form was ready for conduit work. The assembling operations were used as fill-ins during slack times in the shop. These ideal working conditions, as compared with those at the job, were of considerable advantage in reducing the labor cost for this work.

After the bundles of ganged outlets comprising a certain skylight area had been delivered to the job, they were ready to be nailed down in their marked-off outlet locations on the concrete form. Each outlet had already been packed with paper to prevent concrete seepage. Likewise the concrete form had been drilled for concrete grout drainage, at the exact location of each outlet.



Detail of skylight.

After a complete area was in place the home run conduit was coupled thereto and installed to its panelboard location.

An artificial skylight effect was decided upon as the most appropriate means with which to provide soft and evenly distributed illumination for numerous wide crypt corridor areas in this structure. A majority of these areas were furthermore located in the basement.

Sufficient space could not be given for suspending false ceilings far



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enough below the flat concrete slabs to permit the use of conventional reflector units with which to light the glass skylight panels. The arrangement of crypts was in vertical tiers, which left only 5 in. for skylight suspension space at the ceiling.

With such a close space between the glass and upper mounting surface, the outlets were required to be set flush in the concrete form, so as to raise the lamps as much as possible. Thus a concealed conduit installation involving 150 boxes per

The outlet boxes were ganged up on 8 in. centers in the contractor's shop in advance of construction, trucked to the job and placed on the form in this pre-assembled order. Henry and Elmer Classen, proprietors of the Classen Electric Co., are inspecting the materials.

100 ft. was required. The possible economies which could have resulted from the use of metal raceways, designed especially for exposed and closely centered outlets, had to be ignored, due to the foregoing structural conditions. Likewise, the lack of future flexibility in outlet spacings as represented in this concrete encased system was not considered to be a serious factor. Since this building is of a permanent monolithic concrete design, for which future structural changes could hardly be attempted, the lighting system was not considered likely to be altered.

The artificial skylighting system was comprised of a series of colored art glass panels suspended from the concrete. These panels were subdivided in removable frames or sections to facilitate relamping and cleaning. Frosted 10-watt lamps were spaced above these glass sections to give an even, unspotted effect, and to avoid cross shadows being produced from the skylight suspension materials.

The skylight circuits are remote controlled in groups, according to certain area combinations by means of magnetic master switches housed within split-bus panelboards. Remote control stations are located at various logical points in the passages, one or more of these stations being employed per master switch. This permits the turning on or off of the skylights of a given area from any direction of entrance or exit.

## 10 Cent Store Material

By W. A. Haig
Chief Electrical Inspector
Milwaukee, Wis.

The intent of electrical sales control laws is to safeguard life and property and to prevent fraud by making it unlawful to sell certain grades of electrical products unless they have been approved as conforming with certain standards of safety.

The City of Milwaukee has had a sales control ordinance since 1915 and has made periodical inspections of the material on sale in the retail stores from time to time.

Just recently the City of Milwaukee again made a check on the 10 cent store materials in downtown Milwaukee with the same favorable result which has accompanied these inspections in the past, and because of the favorable results that Milwaukee has been having along this line, it is thought that it might be interesting to other cities and inspection officials to have somewhat of a detailed report as to exactly what happens during one of these periodical inspections.

The stores are always approached without warning and a request is made for a sample of everything electrical that they sell. The inspectors then carry these samples to the inspection department at the city hall where they are examined carefully and checked against the various codes and standards for compliance. As a general rule the samples remain in the department for about four or five days when they are again returned to the retailer with a report of the findings of the department and orders for the cessation of sales in any necessary instances.

We examined the materials of four stores. In all a total of 252 pieces were examined and 237 were approved. This left a total of 15 that were condemned, leaving 94 per cent of the pieces finally approved. In other words, Milwaukee found that 94 per cent of the 10 cent store material is safe for use.

The surprising part of this percentage figure is that in the majority of cases the materials carried the Underwriter's Laboratories' labels and were, in some instances, the same type of goods as are handled and sold in the regular market.

This article is not written for the purpose of praising or condemning any store selling electrical materials or any manufacturer of electrical goods. It is merely written for the purpose of passing Milwaukee's experience along to other inspection departments for whatever use and interest it may be.

The accompanying table is a summary of the examinations of the materials generally.

RESULTS OF EXAMINATION OF ELECTRICAL MATERIALS OFFERED FOR SALE IN FOUR MILWAUKEE 10 CENT STORES

| | S. S. Kresge 317 W. Wisconsin Ave. | S. S. Kresge 215 W. Wisconsin Ave. | F. W. Woolworth 301 W. Wisconsin Ave. | F. W. Grand Store 241 W. Wisconsin Ave. | TOTALS |
|---|---|---|---|---|---|
| Pieces examined | 55 | 60 | 67 | 70 | 252 |
| Pieces with Label | 50 | 48 | 50 | 52 | 200 |
| Pieces approved by examination | 2 | 10 | 13 | 12 | 37 |
| Pieces condemned | 3 | 2 | 4 | 6 | 15 |
| Per cent of total pieces approved | 98% | 96% | 94% | 90% | 94% |

# Fabricated Prices for Figuring Small Jobs

A METHOD for estimating or billing materials complete with the installing labor is being employed on jobs running from $25.00 to $500.00, by the Langford Electric Company, Minneapolis, Minn. This plan of handling such work was designed to get away from customer complaints on material prices or rates per hour for labor, and also to eliminate the need for the customer to be concerned about the number of hours required to install the work involved.

Based on the analogy that an overcoat is not displayed with a detailed list of labor, material, lining and padding costs, not to mention thread, buttons, etc., likewise that a panelboard is not billed to the contractor showing the separate prices for steel, copper, switches, hardware and labor, Frank T. Langford compiled for his firm's use a set of combined labor units and material costs, applied a fair markup of about 50 to 60 percent and then tried out his plan in actual business practice.

### Uniform Quotations

When this system was first put into use, this firm employed several solicitors for its wiring business, who were each expected to make estimates covering the jobs assigned to them. This price system permitted them to do a more uniform selling job, with less confusion and at a reduced amount of time spent by the office in the listing, pricing and extending of the smaller items which ordinarily comprise the average small job estimate. On certain occasions it was found that the solicitors would make duplicate estimates of certain work, but no serious differences would result, since each had an identical basis for quoting.

Fabricated price units also simplify the making up of separate or alternate bids on portions of a job, as for example, the work involved on separate floors or in several departments of a customer's premises. A completed bid must also frequently be analyzed for a customer, therefore with these units it is much easier to point out the installed price of a certain run, or circuit which may have a particular bearing upon the case. Likewise, changes in a job layout can be readily refigured without the need for tedious relisting of small items and their labor units.

### Lessens Complaints

A detailed invoice, showing labor and material extensions often fails to check with material lists or signed time slips, thus creating suspicion, slow payment and arguments. Furthermore, if the customer has some buying connection with a wholesaler, or merely an acquaintanceship, there is a strong tendency to check up on the selling prices, just to determine whether the prices are fair. A price on 400 ft. of ½ in. conduit, containing three No. 14 R.C. wires, and which includes the installing labor is not likely to be subjected to unfavorable comparison. A wholesaler's price clerk or city salesman will hesitate to attempt a breakdown of such combined units, having no knowledge of the labor costs which apply.

### A Flexible System

This system is not being used for pricing extremely small jobs where excess non-productive or traveling time would occur, such as one or two outlets in a residence or office. The prices are set up to include $1.00 per hour for labor, and are altered only when major changes in material costs occur. For large conduit and outlet box quantities, a discount as high as 20 percent may be applied to these units to compensate for an increased production efficiency. The units appearing in this presentation are by no means complete but are merely suggestions. Many revisions and additions can be worked out to cover other items as well, all based, of course, upon the prevailing labor costs in the particular community wherein this method might be adopted.

**Outline of Installed Prices for Billing and Estimating System**

*(Based on $1.00 per hour labor)*

BOXES

| | |
|---|---|
| 103 box ½ in. pipe with L&B, ea. | $1.40 |
| Ditto ¾ in. pipe | 1.52 |
| 101 box sq. ½ in. pipe L&B | 1.44 |
| Ditto ¾ in. pipe | 1.54 |
| 111 box 5 in. sq. 1 in. pipe L&B | 2.46 |
| Extension ring 4 in. box | 1.37 |

SWITCH BOXES

| | |
|---|---|
| Gem B wall case for ½ in. pipe L&B | $1.29 |
| Ditto ¾ in. pipe | 1.34 |

CONDUIT—BLACK

| | Per 100 ft. |
|---|---|
| ½ in. conduit 2 No. 14 | $15.52 |
| ½ in. conduit 3 No. 14 | 17.17 |
| ½ in. conduit 4 No. 14 | 18.77 |
| ½ in. conduit 2 No. 12 | 16.20 |
| ¾ in. conduit 5 No. 14 | 25.42 |
| ¾ in. conduit 3 No. 10 | 23.67 |
| ¾ in. conduit 4 No. 10 | 26.33 |
| ¾ in. conduit 2 No. 8 | 22.73 |
| ¾ in. conduit 3 No. 8 | 26.22 |
| 1 in. conduit 4 No. 8 | 37.37 |

CONDULETS AND 3 H COVER, EACH

| Size | F. | B. | A. |
|---|---|---|---|
| ½ in. | $1.40 | $1.30 | $1.24 |
| ¾ in. | 1.71 | 2.05 | 1.40 |
| 1 in. | 3.08 | 2.78 | 2.73 |

ELBOWS

| | |
|---|---|
| 1 in. Ell and Coupling | $1.84 |
| 1¼ in. Ell and Coupling | 2.25 |
| 1½ in. Ell and Coupling | 2.67 |

FUSES

| | N.R. | Renew |
|---|---|---|
| Plug 6-30 amp. | $0.05 | $0.55 |
| Cart. 6-30 amp. | .16½ | .55 |
| Cart. 35-60 amp. | .22 | 1.10 |
| Cart. 65-100 amp. | .55 | 2.20 |

LAMP CORD

| | |
|---|---|
| No. 18 Green cotton | $3.02 |
| No. 18 Brewery | 3.74 |
| No. 18 Reinforced | 5.22 |

SOCKETS

| | |
|---|---|
| No. 10 Brass Key Sox, ea. | $0.71 |
| No. 15 Brass Chain Pull | .88 |

METER SWITCHES

| | | |
|---|---|---|
| 58211 | 30 amp. 2 wire meter | $7.08 |
| 57311 | 30 amp. 3 wire meter | 7.08 |

FLUSH PUSH SWITCH WITH PLATE

| | |
|---|---|
| S.P. | $0.80 |
| Ditto 3 way | .95 |
| Ditto 4 way | 2.53 |



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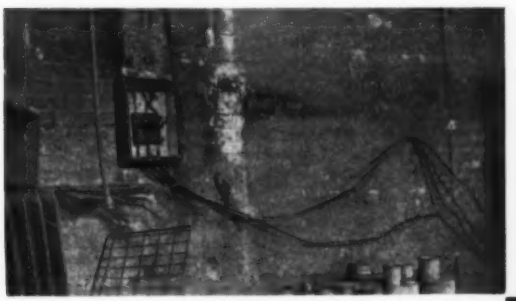
# No. 3—Specialty Products Plant

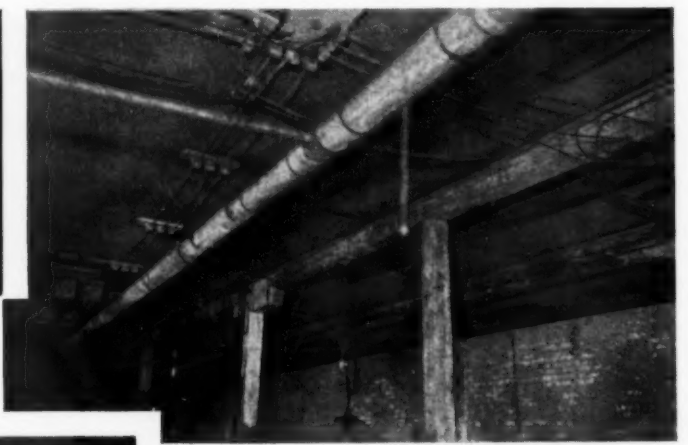
ELECTRICAL reinspection in small factories indicate that the principal sources of trouble arise through obsolescence, "bootleg" wiring and dangerous temporary connections made by inexperienced employees and owners during the depression. The use of obsolete "junk" materials and improper new materials is commonly found in such cases.

The conditions pictured here were found in a small Cleveland plant engaged in manufacturing special combination wood and metal products. Considerable flammable material and rubbish is to be found in the various mill constructed buildings which this concern occupies, therefore many dangerous wiring conditions are so located as to provide a constant fire menace.

A mirrored glass window reflector is hung over a bare lamp, with a brass key socket, draped against the frame of spray booth.

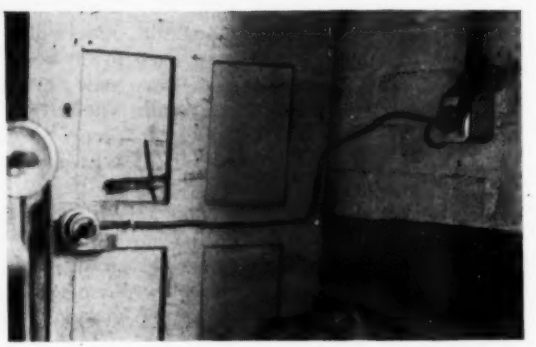


Open motor circuit hung on nails, run from wooden switch box.



Confusion wrought by frequent changes of the open wiring system.

An open wire motor connection has been made to this power cutout cabinet. No bushings protect the conductors where they pass through the cabinet knockout.



One of a group of fractional horsepower motor wiring jobs with stapled cords, the connection made permanent by taping the plug to its receptacle.

# Why Take 10%—With 50 In Sight

By H. C. PLOENSE
Morrison Electric Co.
Portland, Ore.

PRIDE in accomplishment is a justifiable and necessary factor in any business. We contractors take pride in various things—in an excellent mechanical job; an adequate job; having more jobs than any other contractor; in getting the largest jobs, etc. Some take pride, or seem to, in doing work cheaper than anyone else. In my own case, I take greatest pride in selling a job on a 50 per cent basis as against any competition that might be seeking it on a 10 per cent basis.

Obviously it is important to know early about what the prospect wishes to spend, and also what his financial status is. Otherwise you are at a loss whether or not to propose a more expensive job, or in what direction to make such a proposal.

I always try to make some sort of a definite study in advance as to the prospect's financial ability and his general attitude as to spending mony. If he is unknown to me, then he must have been recommended to me by some one. I endeavor to find out who that party was. Generally it is someone I know and to whom I can go and check up in these matters, before the deal is definitely closed. It goes without saying, also, that all the ordinary channels of credit information are checked.

It amounts to this. If the contractor is to strive for a uniformly high percentage of profit, his information about prospective customers must go much deeper than what appears on the surface. To average anything like 50 per cent, it is necessary to get every last bit of play possible out of those customers who have money, who want good work, the most modern installations and are willing to pay the price.

We try to keep the customer sold through the wireman or electrician rather than through the prestige of the company itself. At first glance, this would seem to be rather hazardous, but let me explain.

As an example, we get considerable business by specializing in certain classes of work. We have, for instance, six bakeries, among the largest in Portland. In all these bakeries, I find that the customer thinks in terms of our man who does the work there, rather than the Morrison Electric Co. I am not only content to let them think this way but encourage them in it. Bill has always done the work in one bakery. They think that there is no electrician like Bill. So I always send Bill there. If I should send George, who might be as capable a man in every way, as likely as not they would say that George was no good at all. George, on the other hand, has a couple of bakeries under his supervision where he rates as about the finest electrician in the whole Pacific Northwest.

H. C. Ploense

Therefore, I do not jeopardize the old and stable accounts by sending men indiscriminately. I will even go farther than that. To give the old accounts the service of their favorite men, I would rather jeopardize a newer customer by taking Bill or George off the job there that they might serve an old customer in an emergency.

Also bear this in mind. In every commercial establishment there is some key man—engineer, fireman, janitor, general handy man or what not who has a great deal to say in regard to the electrical work and whose opinion is respected. The first thing I do is to find that man and make myself acquainted with him so that I come to know him by his first name and see and talk with him on every occasion. Lots of times he can make or break you.

I remember well the case of a certain bank that was my good customer, and where I knew this practical key man well.

Along came a contractor who carried an account there and put up a strong argument for some business. When the next small job came up he was given a chance over the practical man's head. Fortunately for us, he bungled it in some small details.

The practical man got hold of this and made life miserable for executives of the bank because of the terrible job that had been done. He said that if we had been permitted to do the work everything would have been all right, etc. The result was that word came down from above that thereafter all the work was to be given to us. And it is good 50 per cent business.

Fifty per cent is none too much to expect in payment for first class work, conscientious service and taking the risks involved in this business. Ten per cent, on the other hand, cannot cover any one of these factors in the long run.



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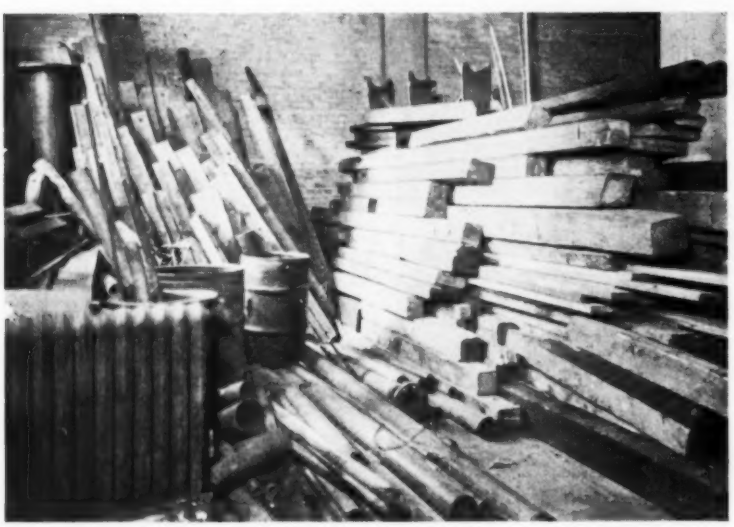
# Practical Tool and Equipment Storage

Benders and hickeys, being made to stand severe abuse, require no particular "babying", so they are merely kept in their own backyard by providing a pipe rail bin. Chains and cable slings are kept hung above.

Large investments in construction tools and equipment warrant liberal well-planned storage space. Bins, racks, wall hangers and the like can be designed so as to be most suited to accommodate particular types and sizes of tools. Crowded tool rooms cause wasted time in loading out the equipment that is requisitioned for a rush job. Valuable tools also may become hidden in a mass of poorly arranged tools, and may be broken or damaged by heavier items being thrown about upon them. The repairing and sharpening of tools upon their return to the shop is difficult, if a crowded condition requires their being "dumped" in with other tools.

The tool storage methods of the Commonwealth Electric Company, St. Paul, Minn., as shown in the accompanying photographs, suggest practical yet inexpensive means of caring for valuable tools. This firm engages in a widely diversified field of large construction projects, thus requiring complete equipment for each operation. When work is slack, a large amount of this equipment must be stored in its shop in orderly fashion, while being checked over and reconditioned for future use.



Heavy power plant operations require cribbing timbers of assorted dimensions and lengths, likewise pipe rollers. A space is kept reserved for such material, separate from all actual tools. It is adjacent to a large truck entrance to minimize loading and unloading costs.



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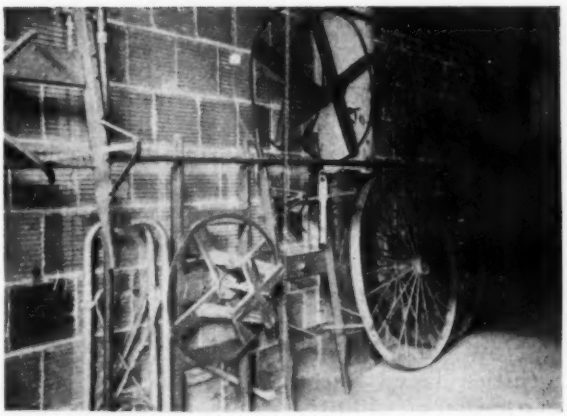

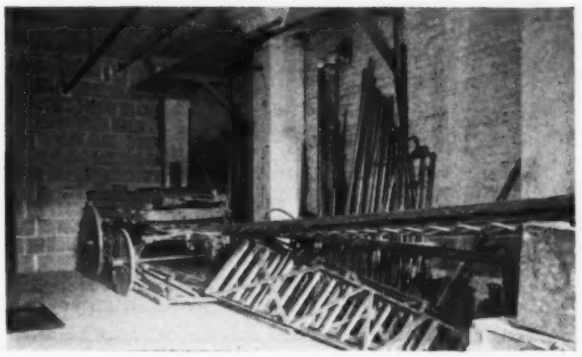

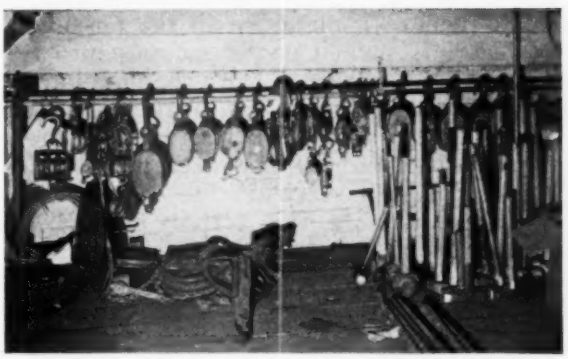

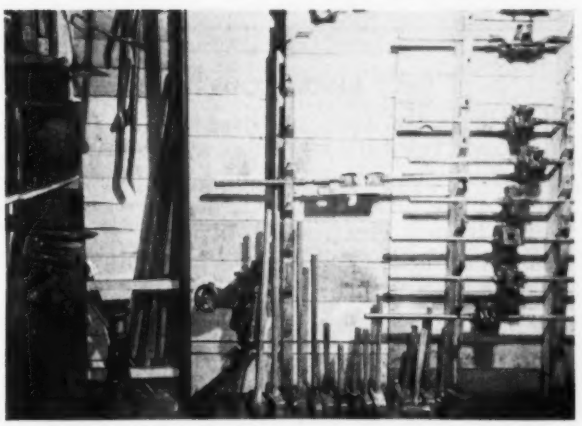

(Upper left) Line construction and white-way work requires tools which consume considerable space. Payout reels, reel racks, trailer wheels, etc., must be stored away in orderly manner. Pipe wall racks are handy for supporting this equipment.

(Upper right) Pike poles, digging and tamping tools, heavy crow-bars are kept out of the way, yet accessible for quick delivery. With them are stored companion tools such as ladders and the short coupled trailer in the background.

(Middle left) Block and tackle and chain falls of various sizes are certainly more accessible when arranged on a pipe rack, than when thrown in a heap, perhaps to be covered by other equipment. Heavy sledges and mallets will take care of themselves if given a little space in which to stand alone.

(Middle right) Small stocks and dies need space and secure means of racking. Wall studs in this small tool room are slotted edgewise to make a simple series of racks. No falling over or crowded piling up of tools occurs here.

(Lower left) Small tools such as draw knives, come-alongs, ratchet dies, reamers, tongs, pinch bars, climbing spurs, bolt dies and taps, air hammers and shanked drilling tools can readily be found when needed when stored in liberally proportioned bins.

(Lower right) Hand tools such as star drills, points, gads, cold chisel levels, oil cans, soldering furnaces and ladles, each in its place, ready to go places and to help do things.



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electrical contracting

*With which is consolidated Electrical Record*

S. B. WILLIAMS, Editor

## RESOLUTIONS

THIS is the time of the year for making good resolutions and we would like, therefore, to suggest some resolutions to the contractors. We feel that we can guarantee to any electrical contractor who will conscientiously follow these resolutions a successful and prosperous business.

1—Resolve to abide by the Code of Fair Competition and encourage all competitors to do likewise.

2—Resolve to help decrease unemployment by selling—selling more modernization jobs.

3—Resolve to promote reinspection.

4—Resolve to make a sincere effort to sell adequate wiring on every job.

5—Resolve to uphold the National Electrical Code and combat any influences tending to tear it down.

6—Resolve to cooperate with the local inspection department to reduce the amount of bootleg wiring.

7—Resolve to tie-in with national and local marketing campaigns such as Better Light-Better Sight.

8—Resolve to take an active part in association work, to help support the local and national organizations and to back up these bodies in all of their efforts to improve the contractor's position.

## UTILITY RATES

THE present policy of Washington to bring down utility rates through threat of federal and municipal ownership is producing a disturbing condition that is bound to adversely affect the electrical contractor.

ELECTRICAL CONTRACTING has maintained for a long time that utility rates could be lowered to the advantage not only of the public but the utilities and the rest of the electrical industry as well. Such reductions, however, were to be promotional in character and necessarily would therefore carry with them load building activities.

Many utilities have, in the last few years, subscribed to that policy and the trend is definitely in that direction. Some of these reductions came as matters of good business policy while others may perhaps have been hastened by the T. V. A. program. Nevertheless, the trend has been in the right direction.

Now what is going to happen? Will the utilities faced with a national rate study, with the possibility of the federal government loaning money to municipalities to build their own plants, with the possibility of federally owned power coming into territories already served, with the unfavorable publicity now in the national press—will the utilities faced with all of these problems, and more, have any incentive to widen the use of their service?

Unquestionably, this activity by the Administration is going to adversely affect the promotional programs of the utilities and that naturally is going to hurt the contractor.

## CODE PROGRESS

AT the meeting in Knoxville, Tenn., last month of the Construction Code Authority and the Construction League it was evident that the electrical contractors had made more progress in the administration of their divisional code than any other division of the construction industry. Credit for this can go to the entire administrative organization from the Divisional Code Authority and its officers down through the three hundred and fifty local administrative committees.

All told there are something like two thousand members of the industry engaged in the administration of the Code. They have given freely of their time and patience to make the code work. It is remarkable that such a large body of men could be organized in such a short time and with very little money available and that the committees should function so well. Of course, all has not been perfect. Unfortunately, however, that is what we hear most about—the compliance that is not secured, instead of the 80 percent of the cases in which compliance is had, and quickly.

There should be no discouragement with the code and the way it is working out. Patience will win in the long run, as many



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local committees are just beginning to find out. Reports are now coming in showing that old offenders are one by one finally giving up the battle and coming into line.

The National Recovery Act, of course, provides for certain punishment if codes are violated. Nevertheless, N.R.A. expects each industry to make every effort first to settle its own complaints and to secure federal assistance in compliance only as a last resort.

The code is really working out better than we had any right to expect. The next twelve months should show a marked improvement in the financial condition of the contracting business as a result.

---

### UNEMPLOYMENT INSURANCE

ONE of the President's programs now receiving consideration at Washington that should greatly interest every part of the building industry is unemployment insurance.

Without going into a discussion of the merits, or the problems, or the ways and means it must be fairly obvious that one of the reasons, if not the most important, why construction costs are not lower is the cost of labor. In times of depression the public finds it hard to understand why construction costs are not lower and without hesitation blames labor. However, we must be fair to labor and study the situation before we criticize.

There is probably no single branch of labor that suffers so much during a depression as building construction labor. Even in normal times this class of labor, on the average, is employed approximately 175 days a year or, if an 8-hour day is worked, 1400 hours. While the hourly wage may seem large, viewed from the angle of time actually employed, it is hard to find much to complain about.

Now take this depression, when building construction fell off as much as 90 per cent, and apply this figure to the normal average. This will give one a truer picture of the reason why labor is not willing to reduce the hourly rate.

However, give to labor in this industry some assurance of income either through regular employment or unemployment insurance and we venture to say that labor can be persuaded to reduce the hourly rate. With the hourly rate down the cost of labor in any job will be down.

While, of course, we may be wrong we nevertheless believe that labor is more interested today in employment, or its equivalent as steady income, than it is in hourly wages. We know of the battle that organized labor has carried on to raise the level of wages and we fully appreciate the importance labor attaches to the rate. Nevertheless, the depression has taught many new lessons and not the least has been that of the blessing of work.

Of course, if unemployment is permitted to continue in the construction industry without any effort to abate it, then unemployment insurance is not going to help building costs any. In other words, it is apparent, that even if wage rates are lowered the insurance must be paid ultimately by the public so that the two equalize each other, if not increase the costs over the present.

On the other hand, it should be apparent to labor and employer that both would be better off if the men were working. What is stopping them—high prices. This situation can be met if both labor and employers will work out ways in which certain classes of work can be promoted.

In the past the electrical people have lead in cooperation between labor and employer and perhaps they can again lead the construction industry out of its trouble. We have some isolated examples of cooperation in this direction already. A study of conditions and opportunities ought to bring a national policy of mutual benefit to all.

---

### SAFE MATERIALS

HATS off to the Electrical Cord Manufacturers for their Identified Cord Movement! Designed, of course, to promote the sale of approved cords only, it is reaching further and through cooperation with several inspection departments is educating the public to demand safe wiring and to insist that the work be done by qualified contractors.

This campaign has been going on for some time and in spite of the fact that it was based on the hazards of unidentified cords, it has not lessened the use of portables. It bears out our contention that the American public wants safety and is not going to crawl into its shell just because someone points out a hazard.

The Identified Cord Movement, fine as it is, cannot, however, do the whole job. The electrical industry should sell approved safe wiring as a whole to the public. The expenditure does not have to be large, but it will pay enormous dividends.

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# \\\ code chats ///

A MONTHLY DISCUSSION OF WIRING PRACTICE AND QUESTIONS OF INTERPRETATION, PRESENTED WITH A VIEW TOWARD ENCOURAGING A BETTER UNDERSTANDING OF THE NATIONAL ELECTRICAL CODE

**CONDUCTED BY F. N. M. SQUIRES**
CHIEF INSPECTOR, N. Y. BOARD OF FIRE UNDERWRITERS

## LIGHTNING ARRESTER FOR RADIO ANTENNA

*If a lead-in is concealed in the partition of a house and brought into a receptacle in an outlet box, where is the lightning arrester (3702-g) generally installed?*

*I cannot see how it could be installed inside the house.*

In this case the lightning arrester should be placed on the outdoor antenna probably where the lead-in is taken off. This would afford the maximum protection.

But rather than use no lightning arrester at all it would be better to install one at the outlet where the set is connected.

## USE OF METAL FRAME OF BUILDING FOR GROUNDING

*907-b-(1) states that when a water pipe is not available as a grounding electrode the metal frame of a building may be used, when effectively grounded, and the connection made in such a manner as to secure the most effective ground.*

*Question 1. When is the metal frame of a building considered effectively grounded, and*

*Question 2. What is meant by "The connection shall be made in a manner to secure the most effective ground?"*

Answer 1. The answer to this is really found in the fine print note following 907-d. Here we find that water piping systems have a resistance to ground of less than 3 ohms and that the metal frames of buildings have less than 25 ohms to ground.

Therefore, the metal frame of a building would not be considered suitable for a grounding electrode unless it showed less than 25 ohms resistance to ground.

Answer 2. This part of the requirement means that whichever of the four ways mentioned in 907-b shows the least resistance to ground, that one should be selected as the grounding electrode when a water piping system is not available.

## MOUNTING OUTLET BOXES ON PLASTER WALLS

*In wiring old buildings with armored cable is it permissible to place the outlet boxes on the face of the plaster?*

Rule 512-j (fourth sentence) permits this for concealed knob and tube work. The second sentence of this same paragraph says that the outlet box shall be flush with the finished surface or project therefrom but it does not limit the extent of such projection.

Therefore, if the box is securely fastened in place there would be no violation. But it should be remembered that the box and the fixture canopy must make a tight "metal to metal" fit and that any hole in the plaster should be repaired.

## MOTOR PROTECTION

*In making up wiring diagrams showing motor connections as used in conjunction with air compressors, the 2- and 3-phase diagrams have been the cause of considerable discussion.*

*All compressors having polyphase motors are equipped with a pressure switch into which is incorporated a thermal protection device for opening only two lines of the circuit in case of overload, which means that one wire of a 3-phase 3-wire installation and two wires of a 2-phase 4-wire installation are carried straight through from line to motor. Certain members of our staff contend that these wires do not have to be thermally protected because they are neutrals and, therefore, are grounded.*

*One diagram shows one wire of the 3-phase circuit and two wires of the 2-phase circuit as grounded or neutral wires with the statement that they should not be connected either through the poles of the switch or through the thermal breakers.*

*Is this correct? Is it not true that there is no grounded wire in a 3-phase 3-wire system and likewise there are no grounded wires in a 2-phase 4-wire system?*

While in the majority of cases 2-phase 4-wire and 3-phase 3-wire motor circuits are not grounded there are cases where such circuits or systems are grounded.

However, rule 808-c-4 requires that when automatic overcurrent protective devices other than fuses are used for motor running protection there shall be at least two over current units such as trip coils or relays used in both of the above mentioned circuits. If any of the conductors are grounded then the units shall be in the ungrounded conductors.

But while two over current units may be all that are required for the protection of the motors, the motor circuits themselves must have over current protection in *each* and every ungrounded wire. For this requirement see rule 808-b-2.

It will be seen, therefore, that the two overcurrent units provide overload protection as all overloads occur in the motor while the motor and the



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# GENERAL ELECTRIC

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

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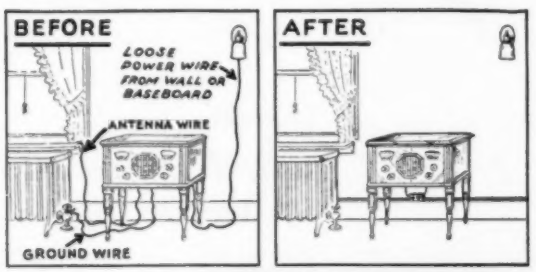
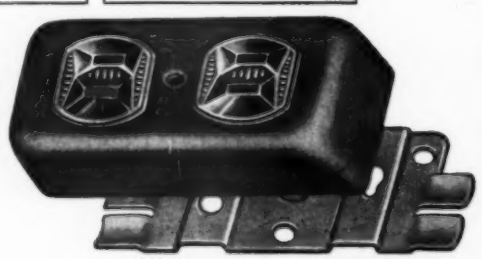



and creates . . .

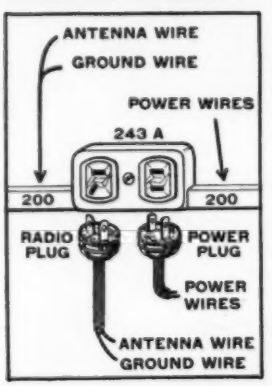
# NEW JOBS!



243-A

*Here, too, Wiremold develops opportunity for new business!*

**ANOTHER demonstration of Wiremold's great versatility and usefulness in meeting all conditions. Wherever there is a wiring problem you can always depend upon Wiremold for a simple, practical solution!**




**THE WIREMOLD COMPANY, Hartford, Conn.**


circuit wires are afforded short circuit protection by the protective devices which are required in each ungrounded wire by 808-b-2.

See also table of 806-o on pages 102 and 103 and diagrams on pages 104, 105, and 106. But again remember that rule 806-a requires that each ungrounded conductor have over current protection so that if the minimum of trip coils or relays as shown in 806-o are used the other ungrounded wires must be protected by fuses.

### APPLIANCE BRANCH CIRCUIT

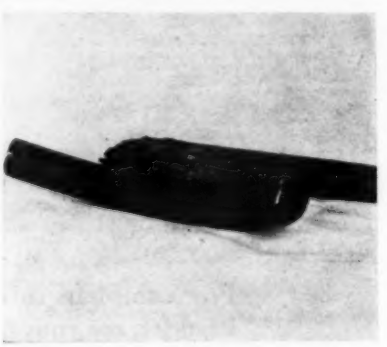
*Would it be in accordance with the rules to install a branch circuit, the wires of which are No. 12, fused with 20 amp. fuses, the circuit being used for lights and an electrically heated device, such as a glue pot, the total connected load being 1400 watts?*

*Can such fusing of a branch circuit be approved?*

*The heating device has a name plate rating of 6.6 amp.*

If permanently connected lighting fixtures are connected on the circuit this arrangement could not be used. The use of fixtures on the circuit would require 15 amp. fuses although No. 12 or larger wire could be used.

Where 20 amp. fuses are used on branch circuits the rules of Section 2006 apply. This requires that the circuit supply only receptacle outlets of the 15 amp. type and that no individual appliance of over 1650 watts be used.



**AN EXAMPLE OF SERVICE CONDUIT DETERIORATION:** Home modernization surveys should always include a careful inspection of the service entrance conduit for evidence of corrosion. In replacing old service conduits at Detroit, Mich., the above conditions were encountered at old services, particularly right at the point where the service conduit "gooseneck" pierces the weather side of masonry walls. The above pieces are ¾ in. black service conduits removed from separate jobs.

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* * * * * * * * * *

**HART & HEGEMAN DIVISION**
**THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD, CONN.**

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# CODE AUTHORITY NEWS

**Material for this Department is furnished by The Electrical Contractors' Code Authority headquarters staff.**

L. E. Mayer, Chairman, 7 So. Dearborn St., Chicago, Ill.

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E. N. Peak, Vice-Chairman, Marshalltown, Iowa
J. G. Livingston, New York, N. Y.
W. A. Ritt, Minneapolis, Minn.
A. J. Hixon, Boston, Mass.
W. W. Ingalls, Miami, Fla.
R. W. Hodge, Kansas City, Mo.
D. B. Clayton, Birmingham, Ala.
Lloyd Flatland, San Francisco, Cal.
R. L. Jacobe, Houston, Texas

*The Code of Fair Competition for the Electrical Contracting Industry is sponsored by the National Electrical Contractors Association*

**MORROW AND MORROW:** The father and son combination never gets tiresome, whether it be in golf tournaments or electrical contracting. The combination seen here consists of E. F. Morrow and his son J. D. Morrow, both of the Morrow Electric Co., Mt. Vernon, Wash. The Morrows have a thriving business, the elder Morrow looking after the contracting end and the son attending to the merchandising end.

### Code Authority to Meet with N.E.C.A. Executive Committee in February

The Executive Committee of the National Electrical Contractors Association will meet in Chicago on February 11, 12 and 13 and the Code Authority will meet in the same city on February 13, 14 and 15. The overlapping of the meetings of the two bodies was arranged for the purpose of holding at least one open meeting of the Code Authority at which the Executive Committee, N.E.C.A. and other members of the industry might present criticisms or suggestions.

### For Uniform State Acts

A model enabling act under which the States would adopt approved NRA codes as state laws to be administered by the state attorney generals has been drafted in the Washington office of the NRA and sent to the 44 States the legislatures of which will convene this winter. Under this uniform act, in any industry where a national code exists a state code will be granted on approval of the governor, but only if the state code conforms exactly to the national code. Uniformity between state and national codes is regarded as essential to obviate the possibiiity of confusion in administration and enforcement. Such coordination between state and federal laws will further strengthen the prosecution of cases where there may exist a doubt as to inter-state or intra-state status.

### Recognize Overhead as Cost on Force Account Work

The original specifications submitted by the engineers for bids on the lighting system for the Huey P. Long Bridge over the Mississippi River at New Orleans, provided that payment for extra work done on a force account basis should be the actual cost to the electrical contractor of labor and materials including delivery charges, as shown by original receipted bills, plus 10 percent.

The local administrative committee for the New Orleans area called the consulting engineers' attention to Article IV, Section 3, Paragraphs A and B of Chapter VI of the Electrical Contractors Code, and asked whether the definition of "cost" as called for in these specifications could be assumed to include overhead or whether the ten percent to be added to the actual cost as defined in the specifications was assumed by the engineers to include overhead. The committee pointed out to the engineers that the provisions in the specifications, which apparently excluded any allowance for overhead, would require a violation of the Code by any bidder submitting a bid on such basis.

As the result of this position taken by the New Orleans committee the engineers in charge of this project, which is being handled for the State of Louisiana and financed by RFC funds, revised the specifications and sent out a notice to all bidders substituting a change in the basis of the contract which provides that payment for all extra work on the project shall be on the basis of the actual cost of all labor, including workmen's compensation insurance, and of all materials, including delivery charges, as shown by original bills, "to which cost shall be added a sum equal to ten percentum (10%) thereof, and in addition the contractor's proven overhead."

### SOUTHEASTERN CODE ADMINISTRATORS MEET

A joint meeting of the Southeastern Industrial Chapter, N.E.C.A., and the members of Region No. 5 Code Administration Committee was held in Knoxville, Tenn., on December 6 and 7, which was attended by four members of the Electrical Contractors Code Authority who were attending the meetings of the Construction Code Authority; L. E. Mayer, chairman, L. W. Davis, executive officer; A. L. Hixon and D. B. Clayton.

The meeting was stated to be most encouraging by chairmen of the different districts because it showed what was actually being accomplished not only in compliance but in collection of delinquent assessments.

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# CONTRACTING news

INFORMATION OF INTEREST TO ELECTRICAL CONTRACTORS CONSISTING OF ITEMS OF NEWS, SHORT ARTICLES, PRACTICAL IDEAS, ETC., OUR READERS ARE INVITED TO CONTRIBUTE TO THIS DEPARTMENT

## NEW N.E.C.A. DUES BASIS

Beginning with January 1, 1935, the dues to the National Electrical Contractors Association will be on a twelve months instead of a calendar year basis. Old members' dues automatically run out December 31 and so they will remain from January to December as before. New members will pay dues for twelve months from the first of the month in which they join.

It has also been voted by the Executive Committee to no longer require the entrance fee of $10.00 for new members.

## PROTESTS GOVERNMENT DOING OWN BUILDING

The Minnesota Electrical Council on November 12 adopted a resolution condemning the practice of the federal government of engaging directly in construction work as a part of its unemployment relief program and other activities. The resolution protested these activities of the government as competition with private business.

Copies of the resolution were sent to all federal and state agencies engaged in construction work.

## COMMITTEE TO IRON OUT CLEVELAND CODE DIFFERENCES

As a result of many complaints against the proposed new electrical code for Cleveland a technical committee has been appointed to redraft the code so as to make it acceptable to all interests. The members of the committee are W. W. Clark of the Dingle-Clark Company, electrical contractors; W. R. McCornack, architect; E. A. Millar, Jr., of the John Paul Jones, Carey & Millar, consulting engineers; V. P. Phillips of Crecelius & Phillips, consulting engineers and Sidney Watkins, electrical engineer of Warner & Swasey Company.

The opponents of the code as submitted include the Chamber of Commerce, Building Owners and Managers Association, Retail Merchants Board and others. The forces favoring the new code were lead by the Cleveland Federation of Labor.

## ELECTRICAL CONTRACTING MOVES TO NEW YORK

ELECTRICAL CONTRACTING this month moves its publishing office from Chicago to New York where it will be located at 330 West Forty-Second Street.

This move will in no way affect the character or policy of ELECTRICAL CONTRACTING, but by virtue of having its headquarters so near the offices of the national associations, the magazine will be in a stronger editorial position than it could be when located at such a distance.

Although the general offices are being moved it will be the policy of the management to continue strong editorial representation in Chicago.

## H.O.L.C. ADOPTS N.E. CODE FOR RECONDITIONING WORK

The Home Owners' Loan Corporation in its reconditioning division has adopted the National Electrical Code for all wiring coming under its supervision. A copy of the Code has been placed in the hands of each of 1,100 inspectors in this phase of H.O.L.C. work.

## CONSTRUCTION INDUSTRY STUDIES CODE PROBLEMS

Results from the meeting at Knoxville, Tenn., on December 5 to 8 of the Construction Code Authority and the Construction League of the United States are expected to be far-reaching in the improvement of code administration and compliance.

William L. Mitchell, Atlanta, Ga., formerly NRA compliance director for that state and now regional compliance director, presented an optimistic picture of enforcement with more aggressive and speedier action under a rejuvenated field compliance set-up. Ten new regional compliance boards would alleviate the Washington bottle-neck on enforcement action by decentralizing procedure and making final decisions in the field.

Arthur D. Whiteside of the National Industrial Recovery Board further revived the courage of code administrative officials when he said that within 30 days a new era of enforcement and compliance would be apparent, but he suggested serious consideration of those portions of the codes which might not be enforceable.

William T. Chevalier, vice-president of McGraw-Hill Publishing Company, urged that the government not only prosecute code violators but that it live up itself to the Construction Code on all of its jobs.

The Construction Code Authority accepted in principle a program for establishing and operating local code councils, and requested the executive committee to develop the plan for reference to localities interested in coordinating and consolidating local administrative activities under the several divisional chapters. Several localities are now proceeding with joint administration by pooling funds available to divisional administrative committees. Suggestions made during the conference had indicated unmistakably that many local code administrators believe that effective administration of the divisional chapters depends considerably upon combining divisional efforts so that the full strength of the local industry stands behind the efforts of each division.

Rules and regulations for establishing and operating joint bid depositories were adopted as applicable to any locality where several divisional groups have established independent depositories. Under such rules a joint bid depository would be supervised

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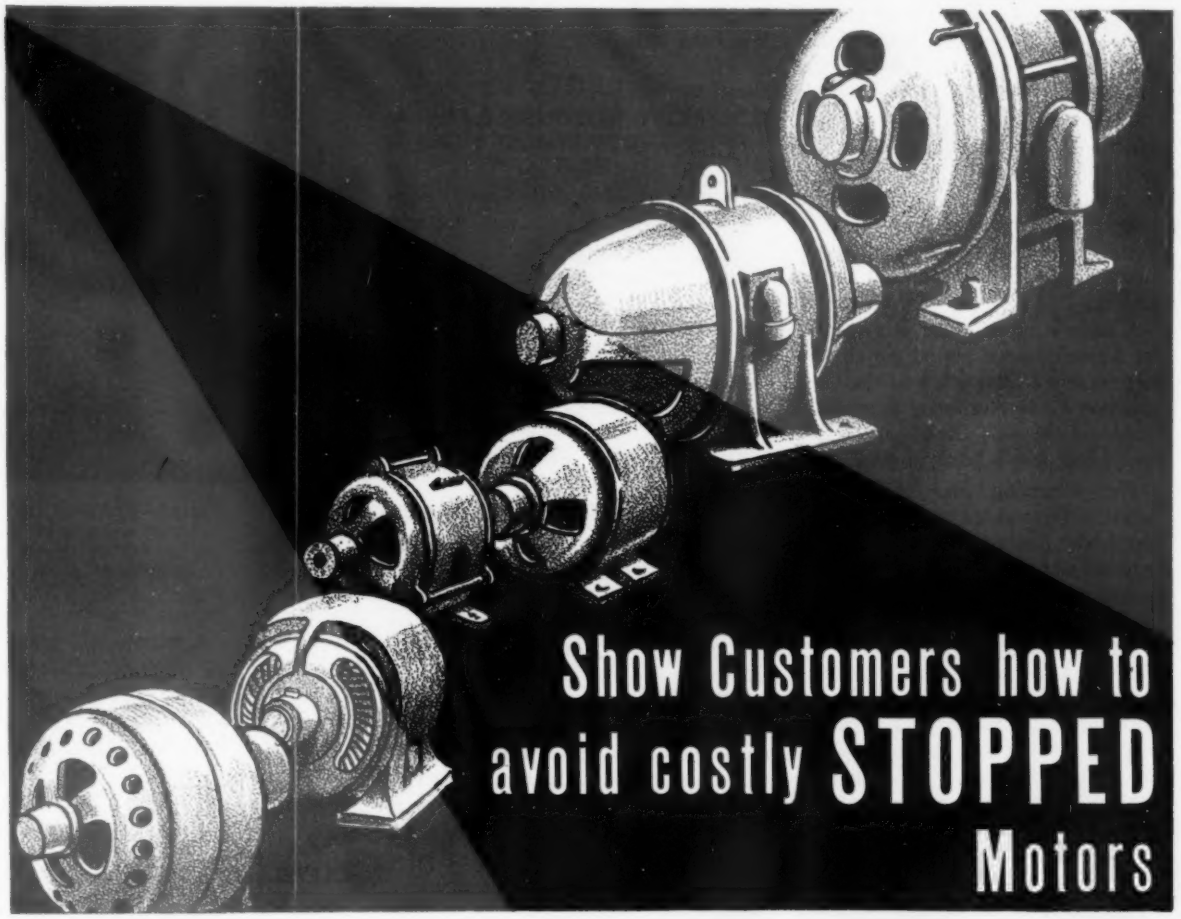
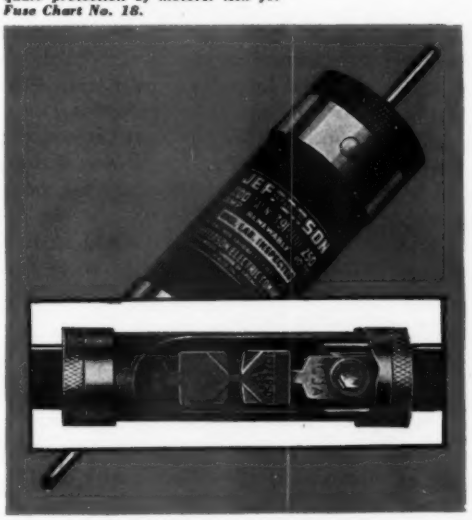



***Fuse Chart—FREE***
***A handy guide to selection of proper size fuses at a glance, for the adequate protection of motors. Ask for Fuse Chart No. 18.***



***The secret of Jefferson Super-Lag performance is in the lag plate on the Super-Lag link. This plate delays the normal fuse action, provides a time interval or lag by absorbing temporary heat rise. This time-lag prevents the fuse from blowing on harmless temporary overloads—saves needless STOPPED Time and link replacements.***

The high cost of STOPPED motors is a sales opportunity for you. Show customers how they can eliminate needless stops which disrupt schedules, stop men, throw production out of step by using fuses which protect TIME along with the motors.

Jefferson Super-Lag Renewable Fuses do not stop motors needlessly. They do not blow the moment current rises—do not blow if the overload is only momentary. But they operate positively before the actual danger time is reached. It is this "wait" which eliminates needless STOPPED TIME—which protects TIME along with motors.

Sell protection against needless stops as well as against motor burnouts by pushing Jefferson Super-Lag Fuses. Made in all capacities, knife-blade and ferrule types.

JEFFERSON ELECTRIC COMPANY
Bellwood (Suburb of Chicago) Illinois

# JEFFERSON
## Super-Lag RENEWABLE FUSES

by a joint local committee representing the several divisions participating, with the filing fees to support the joint operation.

Consideration of ways in which Article VII of Chapter I, controlling competitive bidding practices might be improved and strengthened was assigned to a committee by the Code Authority, which had previously authorized collection of material on this subject.

A more equitable plan was adopted for a two months' period for the apportionment of expenses of the Construction Code Authority among the divisional groups. Development of a permanent plan is being studied.

The Planning and Adjustment Board recommended to the Construction Code Authority that Chapter I be modified to permit several divisions by mutual agreement to effectuate a combined area agreement. One of the advantages of this modification was said to be the more rapid stabilization of labor rates. It was also said that the modification would permit area agreements in sections which do not have specialized contracting so distinctly organized as do larger metropolitan sections.

**ADEQUATE INSPECTION FORCE RETAINED:** Electrical inspection service is kept at a high level of efficiency in Milwaukee, Wis., due to the close cooperation and support given to this work by the Milwaukee Chapter, N.E.C.A., and the electrical workers. William A. Haig, chief electrical inspector, a member of the Milwaukee inspection force since 1914, reports that his department employs thirteen deputy inspectors and a clerk. Special men handle theater work, fire prevention inspections and miscellaneous reports of unauthorized or hazardous installations. The anticipated increase of small inspection orders due to FHA activities will be well taken care of due to this adequately manned organization.

## ELECTRICITY RESPONSIBLE FOR A FIFTH OF DEPARTMENT STORE FIRES

Reports of 1266 department store fires occuring within the period from January 1, 1913 to July 1, 1934, show 182 or 20 percent of the total as originating from known electric causes. The only higher known cause, under the heading of "matches—smoking" was reported as having caused 236 fires or 26 percent of the total. A separate listing of 22 fires or 2.4 percent is attributed to electric irons left on.

The foreging synopsis is from a report appearing in the N.F.P.A. October quarterly, which states that the major causes of electrical fires in department stores were reported to have originated from defective and short-circuited wiring. The report states that 35 fires occurred in sales rooms and 30 in show windows. A considerable portion of the causes are laid to improperly installed and inadequately safeguarded temporary wiring. Defects in Christmas tree wiring and the operation of toy electric trains in show windows or on display counters were responsible for a number of fires.

## NEMA MOTOR STANDARDS

The 1934 edition of the "NEMA Motor and Generator Standards", superseding and greatly amplifying the 1930 edition, is now published by the National Electrical Manufacturers Association. This book has been rearranged to bring together practical information concerning the manufacture, test and performance of a.c. and d.c. motors, generators and combinations of both. There are sixteen major sections of this book for a similar number of separate classes or types of rotating machinery, also a definition section which defines over 150 terms used in dealing with such equipment. A 10-page index facilitates the finding of a particular detail or standard, such as various dimensions, frame numbers, performance ratings, speed range, etc.

This book is considered useful to the consulting engineer, machine designer, and motor purchaser, due to the convenient form by which anyone can readily find answers to many questions pertaining to motors and generators. Containing 176 pages in flexible linen binding, of 8 in. by 10½ in. size, it may be purchased for $2.00 per copy from the National Electrical Manufacturers Association, 155 East 44th Street, New York City.

**MUNICIPAL SPECIALIST:** C. J. Staff, Milwaukee contractor, busily engaged in going over plans for the $15,000 electrical contract on the Metropolitan sewerage job.

## CLEVELAND LEAGUE JUBILEE

The Electrical League of Cleveland on December 8 celebrated its twenty-fifth anniversary at a banquet attended by more than five hundred people.

The Cleveland League is not only the acknowledged "Daddy" of all electrical leagues but ever since 1920 when it started its promotional program it has been in many respects the model for other leagues to follow. For the past twelve years the work of the league has been under the direction of J. E. North and in that time has developed a program of promotion for all branches of the electrical industry.

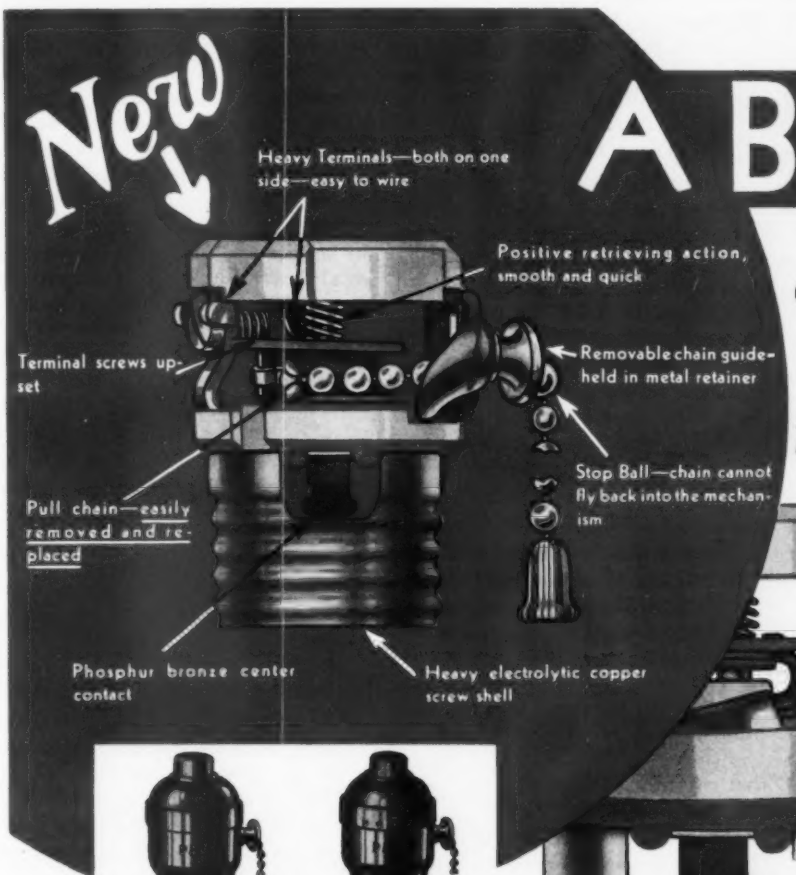
## SHEBOYGAN CONTRACTORS CELEBRATE NEW ORDINANCE

The Sheboygan (Wis.) Electrical Contractors Association met on December 18 to celebrate the passage of the new city licensing ordinance which becomes effective in January. The meeting was attended by almost every contractor in the vicinity of Sheboygan as well as Charles Scheffler, city inspector, and representatives of the

New

# ABUSE

*cannot beat this mechanism*


Heavy Terminals—both on one side—easy to wire
Positive retrieving action, smooth and quick
Terminal screws upset
Removable chain guide-held in metal retainer
Stop Ball—chain cannot fly back into the mechanism
Pull chain—easily removed and replaced
Phosphur bronze center contact
Heavy electrolytic copper screw shell

IMPORTANT
Snubber eliminates strain on mechanism

## *Making Good Products Better*

- But still priced to meet present day competition.
- Building up to a standard—rather than down to a price—has ever been a P&S Policy.
- Often the difference between consumer satisfaction and disappointment is represented by a fraction of a cent per socket!
- There is no substitute for P&S Quality.

PASS & SEYMOUR, INC.
Solvay Station, Syracuse, New York

# P & S PULL SOCKETS

Wisconsin Power and Light Company which cooperated with the contractors in securing the ordinance.

Out-of-town guests and speakers included V. E. Anderson of the Wisconsin State Vocational School who was instrumental in getting the contractors together and who drew up the ordinance; J. E. Wise, electrical engineer for the Wisconsin Industrial Commission, and S. B. Williams, editor, ELECTRICAL CONTRACTING.

## BOYD SUCCEEDS ADAMS WITH CALIFORNIA MOTOR DEALERS

After more than ten years as president of the San Francisco Electrical Motor Dealers Assn., Horace Adams, Farnsworth Electrical Works, San Francisco, retired from that office and Frank Boyd, Pacific Electric Motor Co., Oakland, was elected to succeed him at the annual election of officers of the organization in December. The organization has now become the Electrical Motor Dealers Assn. of Northern California with membership of Oakland and East Bay motor specialists as well as those of the San Francisco area.

Louis Douat, Buzzell Electric Works, San Francisco, was named vice-president and Kieth Noble, of the same company, was re-appointed secretary-treasurer.

**OBTAINS NEW QUARTERS:** W. F. Lindberg, owner of the Peoples Electric Co., St. Paul, Minn., has kept on the lookout during the depression for a desirable building at reasonable cost to house an industrial contracting business. As a result he has located a suitable building of over 10,000 sq. ft. in an area formerly used by a small manufacturing concern. It is at 34 East Channel St., just out of the congested traffic area, has a large trucking entrance, railroad trackage alongside, and good daylight for shop and office. Mr. Lindberg has operated this business since 1922, and during this time has been active in the St. Paul N.E.C.A. Chapter.

## PREFABRICATED HOUSE TO REDUCE COST OF WIRING

A prefabricated small house designed to increase the sale of complete electrical equipment for the home and to reduce the cost of wiring has been on private view for the past month in the Grand Central Palace Building in New York.

The economy of wiring lies in the fact that the rooms will be built around a service shaft in which will be located all pipes and wires.

## CORRECTION

Attention has been called to the figures on page 15 of the November issue showing the average salaries for five years of chief inspectors and district inspectors. Upon further investigation by the committee making this study it developed that the 1932 figures for these two classes were interchanged. They should read for that year: Chief inspector, $261; district inspectors, $257.

Further investigation developed that what seemed like an apparent discrepancy in the 1933 average salary figures is not an error. The extreme drop in the average salary of district inspectors in 1933 is explained in part by part-time work.

## DETROIT MOTOR REPAIR SHOPS COOPERATE

Out of a total of 30 firms in Detroit, Mich., which operate regular motor repair shops, 17 of the leading firms are voluntary members of the year old Electric Repair Association. Considerable progress has been made, it is claimed by the members, in establishing uniform practices for this class of work. Monthly meetings are being held, at which time shop problems, service policies and engineering data exchanges are made for the mutual benefit of all those in attendance.

Special consideration is being given to cost studies on standard operations in the rewinding of motors, armature work and bearing replacements. Due to Detroit's various manufacturing plants, special equipment peculiar to such industries is given proper study in order that a uniform practice may be followed. Particular success is experienced in an interchange between special motor service stations, such as high cycle equipment, special motor generators, exclusive parts, stocks, etc.

The code of ethics adopted by this association pledges its members to fair and honest competition, the prevention of all forms of commercial bribery or corruption, and to strive by service and intelligent cooperation in all lawful ways for increased efficiency and service to the public as a whole.

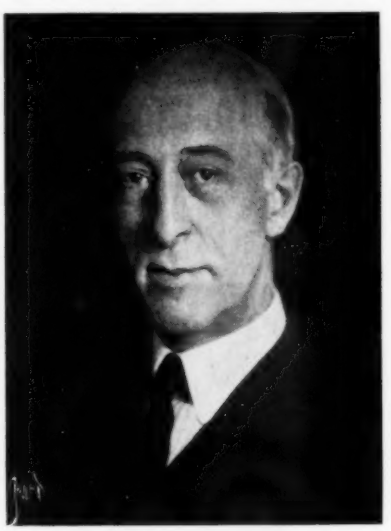
There are no dues for membership nor salaried officers. Associate membership is extended to individuals who are affiliated with firms actively engaged in some division of the electrical industry of which the repairing and reconditioning of electrical apparatus forms a part.

H. E. Van Alstyne of Miller-Seldon Electric Co., Detroit, is president and Roy Spaulding of the Spaulding Electric Co., Detroit, secretary.

## DANA PIERCE

Dana Pierce, president of Underwriters' Laboratories, died at the age of 63 years at Atlantic City, N. J., on December 18.

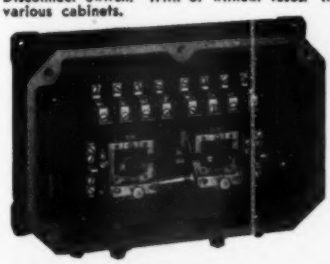
Mr. Pierce was prominently associated with the progress of electrical safety ever since he left the teaching profession as a young man to head up the electrical department of Underwriters' Laboratories. For a great many years he was chairman of the Electrical Committee, N.F.P.A.



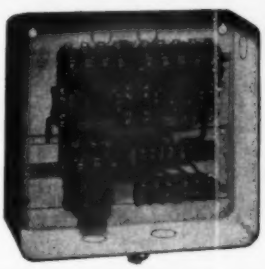
Dana Pierce

He was a past president of N.F.P.A., and during the War served as a member of the War Industries Board.

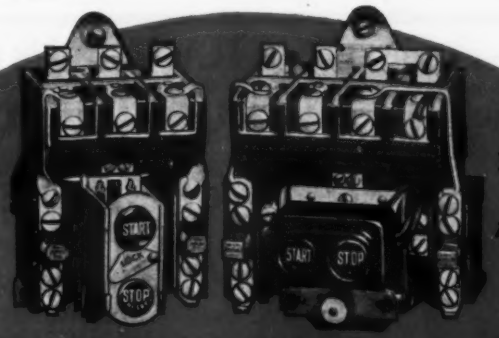
**Bulletin 712** — **COMBINATION STARTER—**
A 709 Automatic Switch with a 609 Manual Disconnect Switch. With or without fuses. In various cabinets.



**Bulletin 705** — **REVERSING SWITCH—**
Two interlocked 709 Automatic Switches. In various cabinets.



**Bulletin 715** — **MULTISPEED MOTOR STARTER—**
Two or more 709 Automatic Switches interlocked for starting multispeed motors. In various cabinets.




# Two Switch Mechanisms and Seven Types of Enclosures make 305 Standard Starters

The combination of two or more of these Allen-Bradley switch mechanisms and seven different types of standard enclosures makes over 300 distinct types of starters that meet a diversity of industrial needs never before achieved so simply by any control manufacturer!

The 609 is a manually-operated switch—the 709 a solenoid-operated automatic switch. Both utilize the same reliable double-break, silver alloy contacts—the same vertical switching motion—the same arc hoods of high current-disrupting capacity — the same thermal overload protection.

Used alone, each mechanism in a wide choice of cabinets, provides manual or automatic starting for A. C. motors in every service. In groups, they combine to form reversing switches, multispeed motor starters, combination automatic starters with the 609 mechanism used as the manually-operated disconnect switch, etc.

Gen'l Purpose

Water-Tight

Dust-Tight

Dust-Tight

Explosion-Proof

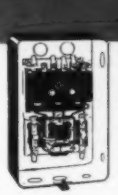
Explosion-Proof

Corrosion-Proof

The enclosing cabinets cover every service demand—general purpose, dust-tight, explosion-proof, water-tight, corrosion-proof.

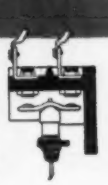
The solenoid-operated automatic starting switch (like the 609) is remarkably compact, with generous wiring space. For complete data on these remarkable switches, send for new bulletins, today!

Allen-Bradley Co.
1307 S. First St., Milwaukee, Wis.



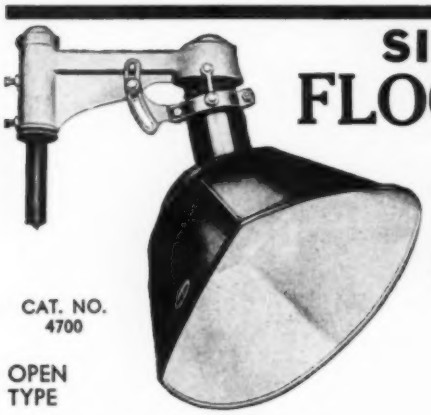
There is ample wiring space. These mechanisms, without cabinets, can be mounted on machines without further insulation.

Double-break silver alloy contacts eliminate contact maintenance. The solenoid action is the latest improvement in switch design.



# ALLEN-BRADLEY

SOLENOID-OPERATED STARTERS



SILV-A-KING
FLOODLIGHTS
*of Quality*
*Built to Sell*

CAT. NO. 4700

OPEN TYPE

With new concealed wiring bracket—porcelain enamel reflector—horizontal and vertical adjustment—cast aluminum and bronze bracket with weatherproof wire trough.

WEATHERPROOF TYPE

Equipped with spreadlite Pyrex heat-resisting lens — aluminum housing and lens holder—easily adjusted focusing mechanism. Pyrex lenses can be furnished in all colors.

CAT. NO. 2003

*Sold thru wholesalers only. Write for catalog.*

**BRIGHT LIGHT REFLECTOR COMPANY**
100 White St. BROOKLYN, N. Y.



**A New HOOK to Increase Your Portable Guard Sales**

New Fool-Proof Strain Relief

Patents Pending

Large Flat Handle that Hooks Anywhere

Extra Heavy Electric-Welded Non-Rolling Cage

Here is a new and different portable guard feature to talk about and demonstrate. The open hook-handle is broad, flat and wide. It fits scores of places that the old wire hook would not fit. Hooks, and stays put, on a bench top, over a pipe, between joints — and it will stand upright as readily as it will hang. Makes the portable guard twice as handy as ever before. Has many other talking points, too! Extra heavy, electric-welded, double plated cage. New strain-relief, stronger, easier to wire, relieving all strain on socket connection.

Twelve Hook-Handle Models

The new McGill Catalog tells the whole story—write for your copy.

McGILL MANUFACTURING CO.
*Electrical Specialties of Quality*
ESTABLISHED 1904
VALPARAISO · INDIANA

Box 670


# A ROLL O' TAPE

ELECTRICAL FLASHES GATHERED AMONG THE BIG WIRE AND PIPE MEN BY ELECTRICAL CONTRACTING'S FIELD EDITORS

THE Commonwealth Electric Company of St. Paul, Minn., provides storage cabinets for the working drawings of all their jobs dating back to 1907.

FIRE loss in New York City due to "spray hood" fires dropped from $88,000 in 1918 to $150 in 1934. This drop is attributed by O. E. Smith, chairman of the fire and accident committee of the Eastern Section, I.A.E.E., to Article 32 which was written in the Code in 1920.

EVEN the contractor's warehouse may be capitalized as a means of publicity. The Dingle-Clark Co., with offices on the twelfth floor of a downtown office building in Cleveland, Ohio, provide a large brightly lighted sign to identify their tool and material warehouse building as such.

SMALL jobs properly managed make good business for the Denny Electric Company, Cleveland, Ohio. Gas station repairs, alterations and new wiring are handled with special service trucks, thus cutting down delays for materials or tools for this varying type of work.

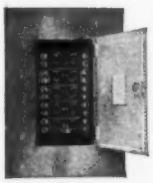
THE man who wired buildings of fifteen or twenty years ago can, through his intimate knowledge of the wiring, take them for remodeling at a lower cost and better profit than his competitors, according to James Rust, Chicago contractor.

WHEN the small city electrical contractor closes up his place of business and starts working out of his own home, as so many have done in the last two or three years, he loses a lot in prestige, no matter how good he may be, and how reliable, and well thought of in his community. Every possible effort should be made to retain his place in the sun, if not one way, then another. We could not

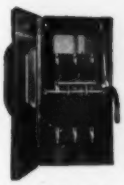
For 35 years the Trumbull Company consistently has developed new and improved lines with a definite object in view—namely to furnish Industry with material of high quality at competitive prices.

We can offer you for 1935 the most complete assortment of Enclosed (Safety) Switches, Panelboards, Power Distribution Boards and other affiliated equipments for complete systems of interior electrical distribution and control obtainable from any one company in the country.

35



Unit Panelboards
Circuits as required — Circuit-breaker, Knife or Tumbler Switch Control

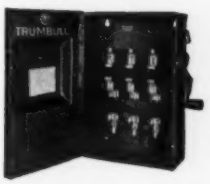


Type "A"—Safety Switch Heavy-duty, Industrial

"Bus-wa"
"Flex-a-Power"
"Controlite"
"RBI" Switchboards

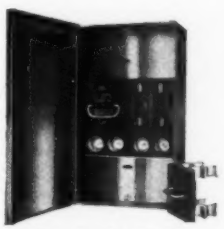
Safety Switches
(Industrial, Entrance)
Open Knife Switches
Circuit Breakers

'ConverTi-Fuse" — the new interchangeable unit Panelboard for Power and Lighting Circuits

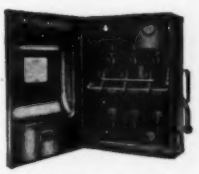


"RB" Industrial Switch with "Vystipe" Fuse Clamps

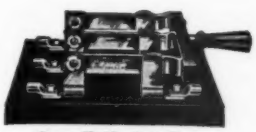
YEARS OF EXPERIENCE



Meter Service Switches
Including combinations for use with Ranges



Types "C" and "D" Enclosed Industrial and Entrance Switches



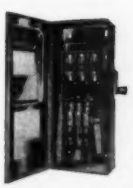
Open Knife Switches

Panelboards
Switchboards
Anchor Taps
Solderless Connectors

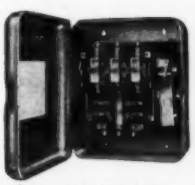
Motor Starting Switches
(Magnetic and Manually Operated)
Miscellaneous Switches

Industrial Circuit Breakers

Type "TM-2" Thermostatic Heater Units Max. H.P. 2 at 550 V.A.C.



Combination Magnetic and Disconnect — in one enclosure — pressed steel or cast iron



Magnetic Switches
In pressed steel and cast iron enclosures—7½ to 25 H.P.

# THE TRUMBULL ELECTRIC MFG. CO.

A GENERAL ELECTRIC ORGANIZATION

PLAINVILLE, CONN.


UMI

# DOWN LIGHTS

## and other Special Lighting Units

THIS new type lighting unit, especially designed for modern illumination of large interiors—from an invisible source—is particularly well suited for general lighting of auditoriums, department stores, ballrooms, dining rooms, and similar applications. The light is projected downward through a small hole in the ceiling, providing pleasing and uniform illumination without the apparent use of fixtures. It is an increasingly popular form of lighting—as shown by the Kliegl down-light installations in the Center Theatre, Radio City; Rainbow Restaurant, Rockefeller Center; dining room of Mr. Rockefeller's private residence; and other instances. Full detailed information of these new lighting units will be furnished upon request.

We also supply many other types of illuminants for built-in lighting, cove lighting, picture lighting, and other modern forms of interior illumination—including spotlights and floodlights of all kinds for unusual lighting and color effects . . and when needed, build special lighting units to exactly suit required demands.

Our reputation for reliable performance, and our experience of many years in the design and manufacture of lighting devices of all kinds, assure satisfaction and economy in final results.

*Profit by our experience—we offer you our advice and service, and will help you get the desired lighting effects, most economically. Catalog of our lighting specialties furnished on request.*

**KLIEGL BROS**

**UNIVERSAL ELECTRIC STAGE LIGHTING CO., INC.**

*Theatrical · Decorative · Spectacular · Lighting*

321 West 50th Street • New York, N.Y.



## *Beating Competition with Brains*

**Competition is tough in the electrical contracting business these days; and every day it gets worse. Successful contractors have found they can beat fly-by-night competition best by using their brains, and by educating their responsible employes. You can help your head men to keep abreast of the times and save you money by sending each his own copy of ELECTRICAL CONTRACTING.**


help thinking of this on a visit to the store of the Irving Lassen Electric Co., Olympia, Wash. In this store are to be found a representative line of electrical appliances, a complete electrical appliance repair department, another department for repairing bicycles and selling bicycle supplies, another for making keys, and a good line of sporting goods, particularly fishing tackle, baseball and golf. The variety brings trade from many directions, which eventually feed the electrical contracting department.

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ONLY eleven states enforce the ASA Industrial Lighting Code, or its equivalent, according to a survey made by E. J. Poor, chairman of the Hygrade Sylvania Corporation. Six states reported an inadequate code and of the rest of the states none reported a code at present, although two are working on one.

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GEORGE P. SVENDSEN, president of the Boustead Electric & Manufacturing Co., Minneapolis, Minn., watches stock turnovers closely and as a result averaged an 8-times turn in selling 30,000 pounds of magnet wire during 1933.

---

STAFF training—J. C. Staff of The Staff Electric Co., Milwaukee, Wis., will have plenty of engineering assistance when his sons George (20) and John C., Jr., (22) obtain their E.E. degrees at Marquette University. A 5-year cooperative course permits their attendance in alternate months, thus one of the sons is at college while the other is on the job, so that both are acquiring practical contracting experience while also obtaining their technical training.

---

SINCE Cleveland's electrical reinspection program was re-established in July, 1934, over 1500 factory and commercial buildings have been visited, some for the first time in four or five years. In addition, 1038 special investigations had been made as of November 15, for which 600 correction permits are reported to have been issued. As a result department revenues have picked up from a former monthly income average of $300 to $500 to a present showing of about $2,000 per month.

---

RANGE and water heater wiring as being done for the Northern States Power Company in the Minneapolis area involves a rotational system of job allocation to the electrical contractors. The firm selected for such work is given about 50 installations during a period of two to four months, after which some other firm steps in to share in this work. Under this system the contractor can secure quantity material prices for his anticipated requirements and is able to assign experienced crews to such work until the completion of his quota of range wiring jobs.

# PROGRESS
## BRINGS CHANGE TO ALL THINGS

## A NEW SAFETY SWITCH WITH PLUS SALES APPEAL

Compare the automobile, the streamline train, the aeroplane, the telephone . . . all of the things of today—with their obsolete forms of yesterday. Progress brings *change* to all things . . . *change* that means *new* sales appeal . . . *new* profits to the alert.

Cutler-Hammer here announces a new small safety switch (Bul. 4140) with every desired feature including new modern styling that registers immediate success. Suitable for entrance switch requirements in many sections. Ideal for oil burners, domestic stokers, air compressors, unit heaters, dairies, laundries, ice plants, stores, etc.

A modern safety switch that puts a finishing touch to any installation to build good will and greater future profits. CUTLER-HAMMER, Inc., *Pioneer Manufacturers of Electric Control Apparatus,* 1306 St. Paul Avenue, Milwaukee, Wisconsin.

C-H

**Positive Make and Break. Plenty of knockouts located near back *edges* to permit direct running of conduit. Not only customary ample wiring space but mechanism completely removable to permit unobstructed pulling of wires.**

# CUTLER-HAMMER SWITCHES
BUILT TO THE FAMOUS STANDARD OF CUTLER-HAMMER MOTOR CONTROL

UMI

**IN these days of reduced office help and constantly changing costs, it is almost impossible for any individual to keep abreast of the price changes on the thousands of items used in the electrical contracting business, yet every *guess* on prices is a *bad guess*—a probable source of loss.**

NATIONAL PRICE SERVICE RESALE PRICES

# A Profitable Investment for Every Contractor in 1935

## *Inject new life into your business!*

IT'S time to get back to fundamentals—to common-sense truths from which we should never have strayed!

Many Contractors seem to think that by increasing their volume of business they automatically add to their profits. It is human to strive for more business but in planning for the future contractors should not place too much dependence upon increased volume as the sole producer of PROFITS—consistent profits on the volume of business obtainable is a safer way to progress.

TODAY—as you read this, hundreds of successful electrical Contractors and Dealers of every kind and size depend upon the NATIONAL RESALE PRICE SERVICE as a safe guide to fair prices and profits—fair to themselves as well as their customers.

If the NATIONAL RESALE PRICE SERVICE were a new and untried Service, you might be skeptical of its value. The fact that it has been recognized for years as an unbiased authority on Resale Prices for Electrical Contractors and Dealers offers convincing proof that you will not be experimenting by accepting it as your "Silent Partner."

A partner who will work every hour of the day without complaint helping you to build a profitable business. Many Contractors tell us that this Service adapts itself to their needs as well as anyone they might hire to do the same work—and for a fraction of the cost.

Don't dismiss the possibilities of this service until you have investgated. We will gladly send full particulars and sample sheets without obligation. Please attach the coupon to your letterhead as the Service is furnished only to those actively engaged in the business.

HENDERSON-HAZEL CORPORATION,
5005 Euclid Avenue, Cleveland, Ohio.

Without obligation, please send us full particulars about the NATIONAL RESALE PRICE SERVICE.

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STATE _____ EC-1-35

**HENDERSON-HAZEL CORPORATION**

**5005 EUCLID AVENUE CLEVELAND, OHIO**

# PRACTICAL METHODS

## BURKHOLDER USES INSTRUCTIVE JOB PLACARD

Believing that small storekeepers, janitors and home owners are still in need of plainly worded instructions about their electrical equipment, the

**LOW VOLTAGE HAZARDS**

*Submitted by*

**Burkholder Electric Company**

6201 Oak St. Phone HI. 6982

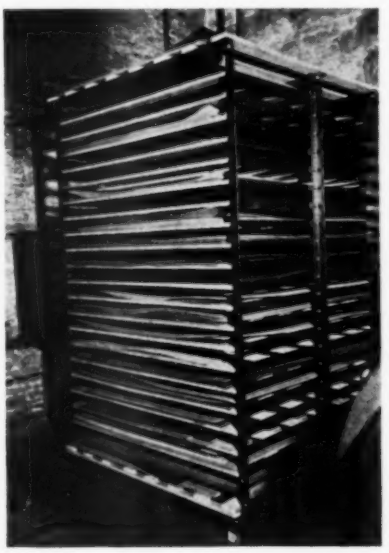
1. Have your electrical installations made, inspected and repaired by competent electricians.
2. Treat all electrical conductors as alive.
3. If you receive a shock from any appliance, device, switch or part of your electrical circuit, even though the shock is slight, have the equipment checked over by a competent man.
4. Be especially careful with electrical equipment used where floors or walls are damp or grounded. Do not stand on a basement or other damp concrete floor or metal surface when using an electric iron or other electrical appliance. Use a rubber mat or a wooden platform.
5. If brass shell sockets are used, they should be keyless and out of reach.
6. Frayed or worn cords, broken plugs or sockets or any bare wires are dangerous. Have them repaired before you use them.

Burkholder Electric Co., Kansas City, Mo., place a printed card form on all their customers' meter-boards, outlining the principal causes of trouble. This form is boldly headed "Low Voltage Hazards" and also bears the firm name, address and telephone number, thus when tacked up in a conspicuous location, it serves to remind customers of whom to call for future work.

## COMPACT SHEET FIBRE STOCK RACK

A rigid steel stock rack designed to accommodate the storage of 5,000 lbs. of sheet fibre in 45 varieties from 1/64 in. to 1 in. thicknesses, yet only requiring 35 sq. ft. of floor space was built by the Boustead Electric & Manufacturing Co., Minneapolis, Minn. Since thin fibre sheets must be stored flatwise to prevent their buckling out of shape, this rack design provides twenty-two flat shelves 56 in. wide by 90 in. long, with a vertical clearance of about 3½ in. between shelf boards. Thus the various thicknesses of red, gray and black fibre may be arranged on the shelves for their easy removal as needed in the shop.

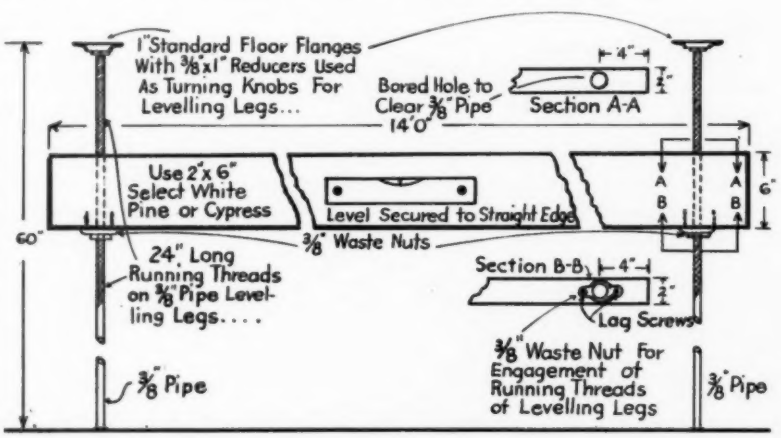
A free standing framework was provided which is accessible from all sides. This consists of eight 2 in. by 2 in. by 93 in. long angle iron uprights, joined at top and bottom with horizontal 2 in. by 2 in. angle iron cross members. The uprights are bolted to 4 in. by 1½ in. channel floor sills. 1½ in. by 1½ in. by 90 in. long horizontal angle irons are bolted at



4 in. centers to the inside face of uprights, with their free flanges facing in from opposite sides of rack to provide ledges and end stops for nine ⅞ in. by 4 in. by 56 in. long wood slats per shelf. A total of one hundred and eighty wood slats 56 in. long were used for shelf cross members, while sixteen wood slats 90 in. long were used to make the top and bottom shelves since these latter slats run lengthwise of rack and rest upon the angle iron cross members which support the uprights at top and bottom. All slats are separately bolted down in a correctly spaced position.

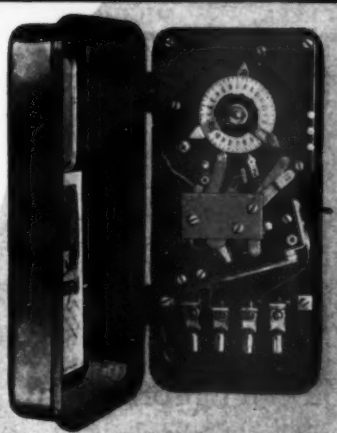
## COMBINED STRAIGHT EDGE AND LEVEL

A 14 ft. span straight edge and level combination as a substitute for rubber tube water level was made up by Porter, Glore & Glass, Inc., of Indianapolis, Ind., for use on their large theatre and commercial jobs where exact outlet rough-in locations needed to be determined. A select 2 in. by 6 in. by 14 ft. cypress straight edge was bored edgewise at ends for its 6 in. width to clear ⅜ in. pipe. Three-eighth in. tapped 2 hole flanges (waste nuts) were fastened to bottom side of straight edge and served as threaded guide plates for the insertion of two 60 in. long ⅜ in. iron leveling pipes, each with 24 in. running threads at upper ends. The top of each ⅜ in. pipe was fitted with a standard 1 in. floor flange reduced to ⅜ in., securely locked in place to serve as a turning wheel or knob. The turning of either ⅜ in. threaded pipe lowers or raises that end of straight edge by reason of threaded guide plate attached to under side. A level secured to one side and at midpoint of straight edge completes the assembly. When one end of straight edge is lined to level with a known bench mark, a new bench mark may then be established at any point within 14 ft. therefrom in quick time and without interruptions as occur when water level tubing is exposed to wheelbarrows, etc.



# SANGAMO DEVELOPMENTS in '34

## MEAN PROFITS TO YOU IN '35

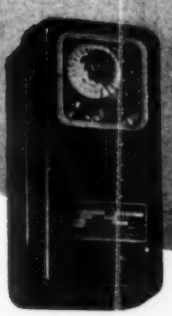


**Form VSY or VWY**

VSY and VWY are two-circuit time-switches, self-starting motor or electrically wound respectively—Two different sequences of operation can be furnished by reversing the action of contact blades—Standard sequence is: Both circuits "on", one circuit "off"; second circuit "off".

**Type K**

A new synchronously motored time-switch supplied with or without window for controlling sign or window lighting. Low priced.



**Form TW**

Low priced—direct current—electrically wound—opens new fields in direct current controls.

DURING 1934 the SANGAMO Line of Precision Time-Switches was augmented by three new and distinctive models—each having a very definite function to perform.

These three time-switches were developed because you asked for them—because you needed them—because their addition will make it easier for you to sell more time-switches at a profit.

The SANGAMO Line of Time-Switches is now complete as far as future applications can be anticipated. This line will mean profits to you in 1935. It widens your range of sales possibilities by its completeness.

When you need a time-switch, no matter what type, be sure to ask your jobber for SANGAMO. You'll find the right one to perform any job to your complete satisfaction. There is a SANGAMO jobber in every distribution center. See yours.

SANGAMO ELECTRIC COMPANY

SPRINGFIELD, ILLINOIS

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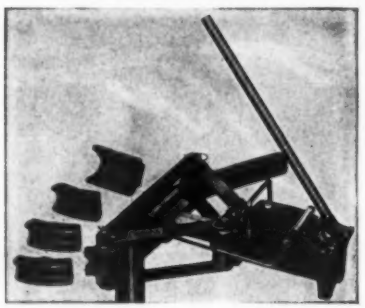
# GREENLEE TOOLS
## *Are Profitable Investments*

WHEN you invest in Greenlee Benders and Knockout Tools, you are helping yourself to meet competition and to make a profit on each job. In fact many cases can be cited where these tools have more than paid for themselves on the very first job. And they are liked by the mechanics, too, which is much in their favor.



### Hydraulic Conduit Benders

Greenlee Hydraulic Benders are profitable investments, because they bend conduit quicker and easier than by other methods. In addition they make smooth, even bends, eliminating many fittings and making it easy to pull in wire and cable. They are easy to take to the job, too, because they are portable.

### Knockout Tools

Greenlee Knockout Punches and Cutters make it easy to enlarge holes in switch boxes, cabinets, etc. They form clean-cut holes quickly and accurately, without any reaming or filing. And they are easy to operate in close quarters, too.

### Other Tools

Hydraulic Pipe Pushers

Joist Borers Bit Extensions

Electrician Bits

*Let Us Send Complete Information*

**Greenlee TOOL CO.**

ROCKFORD, ILLINOIS, U.S.A.

GREENLEE TOOL CO.
ROCKFORD, ILLINOIS
Please send complete information on the following:
☐ Conduit Benders
☐ Knockout Tools

Name .....
Street .....
City .....
State .....
My Jobber is.....

1-35


# Manufacturers News

### G-E TO SPONSOR LOW PRICE HOME COMPETITION

Cooperating with the Federal Housing Administration and to stimulate interest in small home building, Gerard Swope, president of the General Electric Company, has announced that his company will sponsor a national competition beginning Jan. 1, 1935, among architects for designs of small homes that will provide the utmost in modern convenience and livability.

A total of 54 prizes, aggregating $21,000, will be offered to architects and designers. It will be possible for one architect to win awards amounting to $5,000. Demonstration homes will later be constructed in various parts of the country.

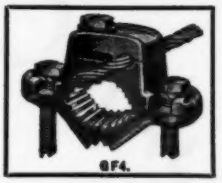
"This competition will enable the public to get a new vision of what an inexpensive home can be like in this new era of our national development," Mr. Swope said. "Science has made great strides in home electrification even through the depression years. Great improvements have taken place in home lighting. The toilsome, troublesome heating problem has been solved, and air conditioning has arrived to make the home healthier, cleaner, more comfortable the year around."

---

General Cable Corporation, New York City has just released an 8-page bulletin entitled "General Cable Romex Non-Metallic Sheathed Cable." The booklet contains a page devoted to the construction features, a table of average dimensions and weights of Romex non-metallic sheathed cable, a reprint of the 1933 Code rules for non-metallic sheathed cable and diagrams showing how this cable is used in wiring new and old houses.

---

S & M Lamp Co., Inc., Los Angeles, Calif., has just released its general catalog No. 20 describing S & M flood-lites. The catalog contains descriptive matter on different types of flood-lites as well as illustrations and price-lists. Distribution curves and intensities are also shown, together with special flood-lites for construction equipment, S-M series reflectors and detailed layouts for recreational lighting.


# SHERMAN RIGID GROUND FITTINGS

**Approved**

The SHERMAN Rigid Ground Fittings give perfect conductivity, ease of installation and great flexibility—Can be used with flexible wire, bare wire or rigid conduit. Made for both soldered or solderless installations.

**GF4**

This Fitting is designed for bare or insulated wire handling sizes in range from No. 4 stranded to No. 8 wire. The No. 4 wire need not be bent in assembly as snubbing action of indented groove in assembly assures a tight contact. Bosses on sides of bolt slots for clamping pipe prevent lock washer from slipping out while assembling. Has slotted pipe clamp jaws which are reversible for use with ground rod. Sherman makes a complete line of 6 rigid ground fittings to fill any requirements.

Send for Trade Bulletin No. 12.

**H. B. SHERMAN MFG. CO.**
BATTLE CREEK, MICHIGAN

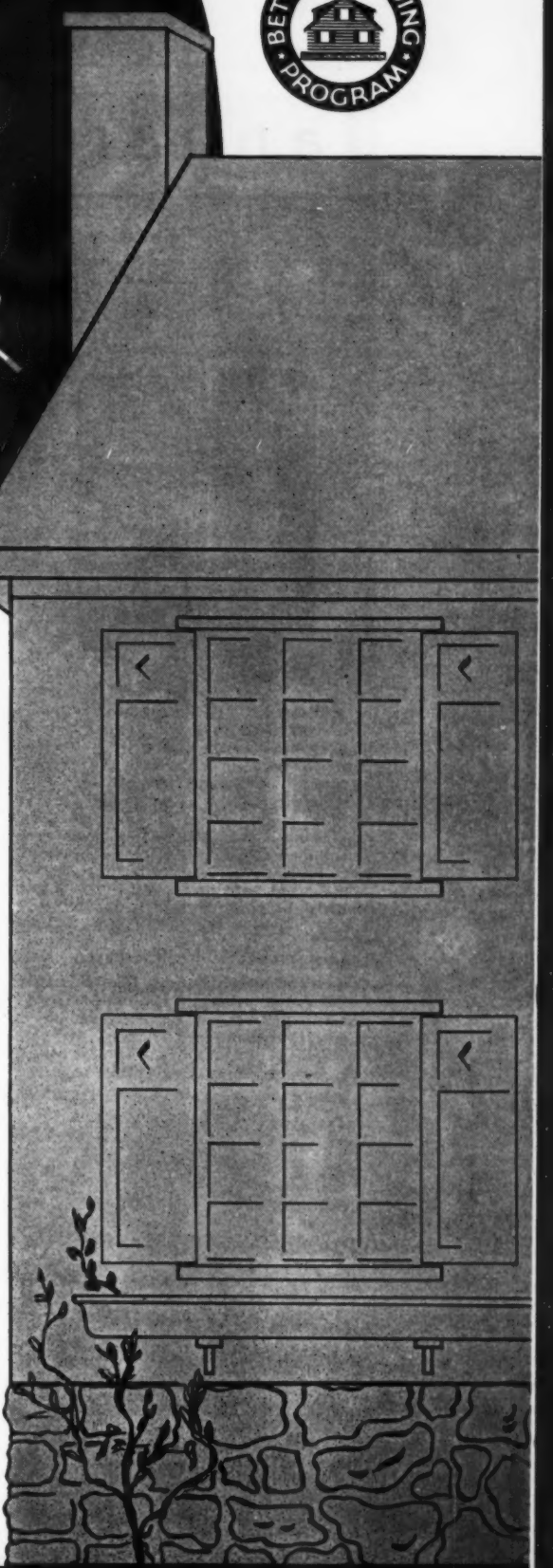
# *Subscribers*

**You can't afford to miss a single issue**

**Give us your new address if you have moved**

# For ECONOMY DEPENDABILITY SPEED *in all* 1935 *Modernization Work* USE-

# PARANITE



## SAFECOTE WIRES AND CABLES

A. B. C. CABLE

PARAFLEX NON-METALLIC SHEATHED CABLE

PARADUCT NON-METALLIC CONDUIT (LOOM)

The same high quality which has always been identified with Paranite Products is in Paranite Safecote.

"More Than Code Requires"

Be certain of the best in armored cable and non-metallic sheathed cable—insist upon Paranite A. B. C. and Paraflex.

All Paranite Products are made right for absolute dependability in the big 1935 Modernization Programs.

If It's PARANITE It's Right

## PARANITE WIRE & CABLE CORP.

JONESBORO, INDIANA

*Division of*

ESSEX WIRE CORPORATION, Detroit, Michigan

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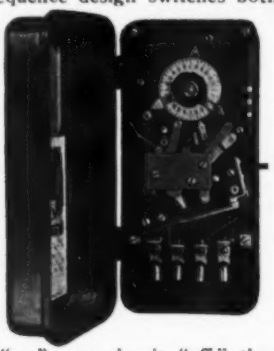
# January New Products

### Two-Circuit Time Switch

A 40 amp. time switch which provides sequence operation for two separate circuits in two different styles of switching sequences is announced by Sangamo Electric Co., Springfield, Ill. The standard sequence design switches both cir-



cuits "on," one circuit "off," then the second circuit "off." This device can be furnished with reversed action contact blades, thus giving opposite sequence, namely: One circuit "on," the second circuit "on" and both circuits "off." This two-circuit feature is available for 115 or 230 volts, model B time switches employing either the self-starting synchronous motor or the electrically wound type with or without omitting device. Standard or astronomic dials can be furnished. Shipping weight is 6½ lbs.

### Compact Circuit Breaker

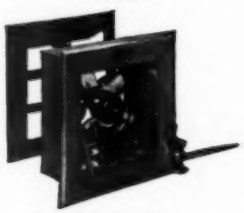
Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., announces a low voltage "De-ion" breaker, similar in general to the standard 600 amp., 600 volt AB breaker brought out several years ago, with the major exception that the

new breaker is claimed to have an interrupting capacity of 20,000 amps. It is totally enclosed, being mounted in the standard 600 amp. molded case, and is available in all ratings from 50 to 600 amps., complete with standard tripping accessories and motor mechanism. In developing this heavy duty AB-20 breaker it is claimed that its interrupting capacity has been doubled over that of the standard AB breaker. This was accomplished by a complete redesign of the contact structure and major modifications in the "De-ion" chambers and operating mechanism. The cold cathode principle of arc extinction as used in the standard duty breakers has been retained.

### Range Receptacle

No. 3826 range receptacle is announced by the Bryant Electric Co., Bridgeport, Conn. This device is rated 50 amp. 250 volts and employs solderless connections. Knockouts are provided in bottom and back for ¾ in. and 1 in. con-

duit, with cable clamps in connection with these knockouts. The design is also arranged to take No. 3827 grounding strap, which provides a grounding means for this receptacle when metallic cable cord sets equipped with grounding prongs are used. A glossy black templus casing is featured by the manufacturer in announcing this product.



### Built-In Ventilator

Diehl Manufacturing Co., Elizabethport, N. J., announces its Wind-O-Vent cabinet ventilator for flush wall mounting. A 13⅛ in. square wall opening is sufficient to house this unit and it will fit any wall which is 9 in. or more in thickness. The cabinet containing the ventilating fan fits flush with the inside wall, while an outer frame comprising a set of horizontal louvres fits flush with the outside wall. A hinged door within the room encloses the motor and serves to provide double weather protection. This door is equipped with a mechanism to start the motor when the door is opened, while the air pressure from the fan opens the gravity operated louvres. The fan blades are 10 in. in diameter, for which a capacity of 800 c.f.m. is claimed with a current consumption of 35 watts.

### Outdoor Floodlight

A weatherproof general utility "Silv-A-King" floodlighting unit is announced by Bright Light Reflector Co., New York City, for outdoor service such as garage driveways, porches, gardens, playgrounds, parking spaces, etc. This equipment is made in three lamp sizes:

75-100 watt, 150-200 watt, and 300-500 watt. An aluminum one-piece housing finished in satin anodic process inside and out is claimed to be weather resisting, non-tarnishing and non-corrosive. A grey iron cadmium plated bracket provides adjustment to any position. An approved rubber covered cord and unbreakable rubber attachment plug is provided with each unit.

### Solderless Connector

A porcelain cap solderless connector for use in places where high temperatures might melt bakelite connector caps has been announced as an addition to the "Marr" line by Rattan Manufacturing Co., New Haven, Conn. The No. 7 porcelain cap connector has a capacity up to 5 No. 12 single braid rubber covered wires, or the equivalent.

### Conduit Supports

A line of Everdur metal Minerallac hangers and Jiffy clips for use in supporting Everdur metal rigid conduit and Everdur electrical metallic tubing has

been announced by Minerallac Electric Co., Chicago, Ill. This additional line of hanger material was developed for use under conditions where strong corrosive acids, vapors and gases are present. A cadmium plated steel hanger for electrical metallic tubing is also available.

# A PRODUCT IS KNOWN *by the* COMPANY IT KEEPS

Progressive companies in many fields are now wrapping and sealing their products in Cellophane, but in each field there has been one pioneer to lead the way. Panther and Dragon were the first commercial tapes to adopt this protective sheathing, a step in keeping with their policy of leadership —a leadership extending from the superior qualities of the tape itself to the Modern way of packaging and merchandising it. A product is known by the company it keeps, and dealers and jobbers everywhere know that it pays to stock a leader.

## HAZARD INSULATED WIRE WORKS

*Division of*

## THE OKONITE COMPANY

*Factories:* Wilkes-Barre, Pa. Passaic, N. J.

# January New Products

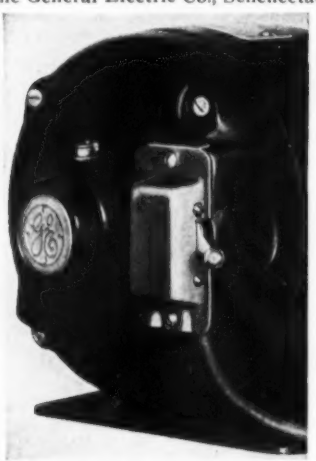
### Enclosed Transformer

A line of completely enclosed air-cooled transformers announced by Jefferson Electric Co., Bellwood, Ill., provides separate compartments for the protection of primary and secondary

connections. Knockouts are provided in the enclosing case for flexible or rigid conduit, or for porcelain bushings if open wiring connections are made. Built in various ratings and capacities up to 20,000 volt-amperes, their use is recommended for supplying 110-220 volt current to lamps, small motors and heating appliances from lower rate power circuits of higher voltages. Long runs of lower voltage feeders may be avoided in using such transformers at points which are isolated from 110/220 volt current supply.

### Motor-Mounted Switch

A compact single-pole tumbler switch rated 6 amps. at 125 volts or 3 amps. at 250 volts, designed for direct mounting on terminal boxes of G-E fractional horsepower motors has been announced by the General Electric Co., Schenectady,

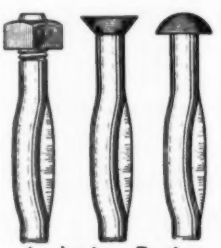


N. Y. The device is mounted in a steel case which replaces the standard terminal box cover plate, and is so mounted that only the tumbler handle extends beyond the motor profile at the side. A positive snap-action mechanism, simple to install, requiring no soldering connections or additional wiring connections are claims made by the manufacturer. This switch is suitable for use where overload protection is not required and where locked rotor current of the motor need not be broken, in such typical applications as woodworking tools, valve grinders, drills, paint sprayers, etc.

### Outlet Boxes

The National Electric Products Corp., Pittsburgh, Pa., announces an outlet and switch box knockout, trade-marked the "Centr-pri," to facilitate the removal of knockouts and eliminate the use of more than one tool in the operation; and an

identifying red edge around the top of each box, trademarked "Redege." The "Centr-pri" consists of a slotted opening in the center of the knockout, so placed that the insertion of a screwdriver and an upward and downward prying movement is claimed to completely remove the knockout. These "Centr-pris" are designed to be removed from either the inside or outside of the box.



### Anchoring Device

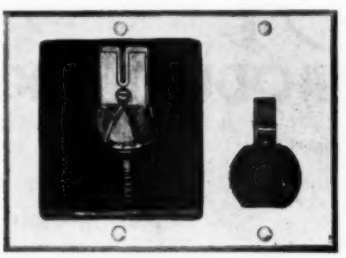
Rawl-Drive, a one-piece steel expansion type anchoring device for holding or attaching anything to concrete, brick, stone or other solid masonry is announced by the Rawlplug Company, Inc. New York City. Similar in appearance to that of a bolt, with several style heads, round, counter-sunk and threaded stud, it is driven by hammer into a drilled hole, thus providing thorough anchorage, it is claimed, without further caulking. The holding power is obtained through shearing the body of the anchor bolt longitudinally through the center. This sheared section is then deformed or bowed outwardly, which forms a spring tension. The 3/16-in. Rawl-Drive is claimed to withstand 1200 lbs. direct pull when embedded in 1-2-4 concrete while the ½-in. size withstands 12,000 lbs. pull. The bolts are made of especially treated high carbon steel with standard cadmium plated finish. Natural black finish can be supplied.

### Three-Light Canopy Switch

A porcelain canopy switch announced by the Bryant Electric Co., Bridgeport, Conn., is rated 10 amp., 125 volts, 5 amp., 250 volt, which is sufficiently high to control three-light lamps. It is equipped with No. 16 C. F. wire leads 6 in. long. The operation sequence is 1, 2, 1 and 2, "off." A 13/32 in. long mounting stem is furnished. This switch is 2 13/16 in. in diameter and 1 7/16 in. high.

### Appliance Outlet

A concealed and adjustable cord connection for the appliances used in kitchens, breakfast nooks and laundries is announced by Bosch Products Co., San Francisco, Calif. "Boschord," as this device is named, provides a 6-ft. appliance cord suspended in a metal raceway concealed within the wall. This cord is equipped at its free end with a universal appliance terminal, which by a slight pull or release is automatically



adjusted to any desired length of cord up to 6 ft. When not in use, the entire cord is automatically retrieved within the metal housing and the cord terminal then fits into a recessed compartment provided as a part of the outlet plate. The cord retrieving and checking features are designed to operate without the use of spools, drums. reels, rollers, ratchets, springs or contact brushes, thus a minimum number of parts are used, which are claimed to be easily serviced or repaired. The flush outlet plate (which is of standard 3-gang size) includes a tumbler switch for disconnecting the automatic cord. Also a convenience outlet for plugging in appliances which are equipped with direct connected cords. The metal cord enclosing raceway is attached to its outlet box in a vertical position, and will frame into a 3-in. partition. Its length permits the outlet to be centered 48 in. above the floor. The device is supplied complete with a 6-ft. No. 16 cord and Universal terminal ready for installation in the wall. The shipping weight is 14 lbs.



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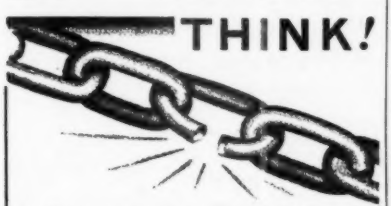
**Increase Your Profits**
and be sure of permanent anchorage of Conduit to Masonry or Concrete
USE CHICAGO
**Expansion Conduit Hook Bolts**
Costs you half of what other methods cost and saves time on the job. No other fittings required. Made in sizes from ¼" to 1½".

*Send for samples and attractive prices*
**CHICAGO EXPANSION BOLT CO.**
128 S. Clinton St. Chicago, U. S. A.



"... no stronger than its weakest link..."
**A SIGN IS NO BETTER THAN THE ELECTRODE YOU USE**
**Chicago Electrode Laboratories**
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*"Standardize on* **STANDARD** *Transformers"*
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**ALL TYPES**
Indoor and Outdoor Service
•
**Send for Descriptive Bulletin**
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**Keep Up-to-Date**
By reading these pages you will acquaint yourself with what is newest and best in electrical supplies and equipment.
When communicating with an advertiser mention
**Electrical Contracting**

Ilg Electric Ventilating Co., Chicago, Ill., has just published booklet No. C50, which is a condensed catalog and handbook of ventilating, heating, cooling and air-conditioning equipment. This booklet is pocket size and contains illustrations of the different units, together with specifications and dimensions of the different units.

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D. C. Kendall, former district manager of the Denver office of the Square D Company, Detroit, Mich., has been promoted to assume charge of the switchboard and panelboard division at Los Angeles. A. M. Campbell succeeds Mr. Kendall as district manager, effective October 1.

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The Central Tube Company, Pittsburgh, Pa., announces the appointment of R. J. McGoldrick, 12 White Avenue, Brookline, Mass., conduit representative in the New England territory.

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The RCA Victor Company, Camden, N. J. announces the appointment of W. L. Rothenberger as manager of the centralized sound department. Mr. Rothenberger was formerly the Atlanta, Ga., district sales manager of this department.

---

The Holophane Company, New York City, announces that A. D. Cameron, who joined the company in 1931 as manager, has been elected vice-president, with headquarters in the New York office.

---

Wolverine Tube Co., Detroit, Mich., has appointed Frank J. Kysela, 614 Interstate Building, Kansas City, to handle the sale of Wolverine soldering lugs and splicing sleeves in Western Missouri and Kansas.

---

A new sales office in charge of R. R. Cooper has been opened by Ilg Electric Ventilating Co., Chicago, Ill., at 122 Jay St., Schenectady, N. Y.

## Classified Advertising

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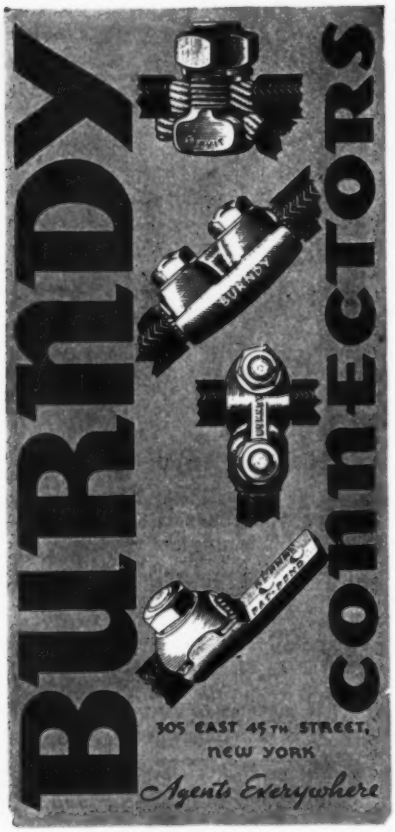


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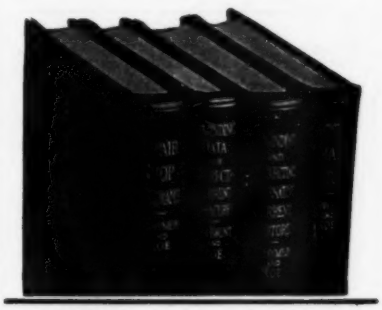

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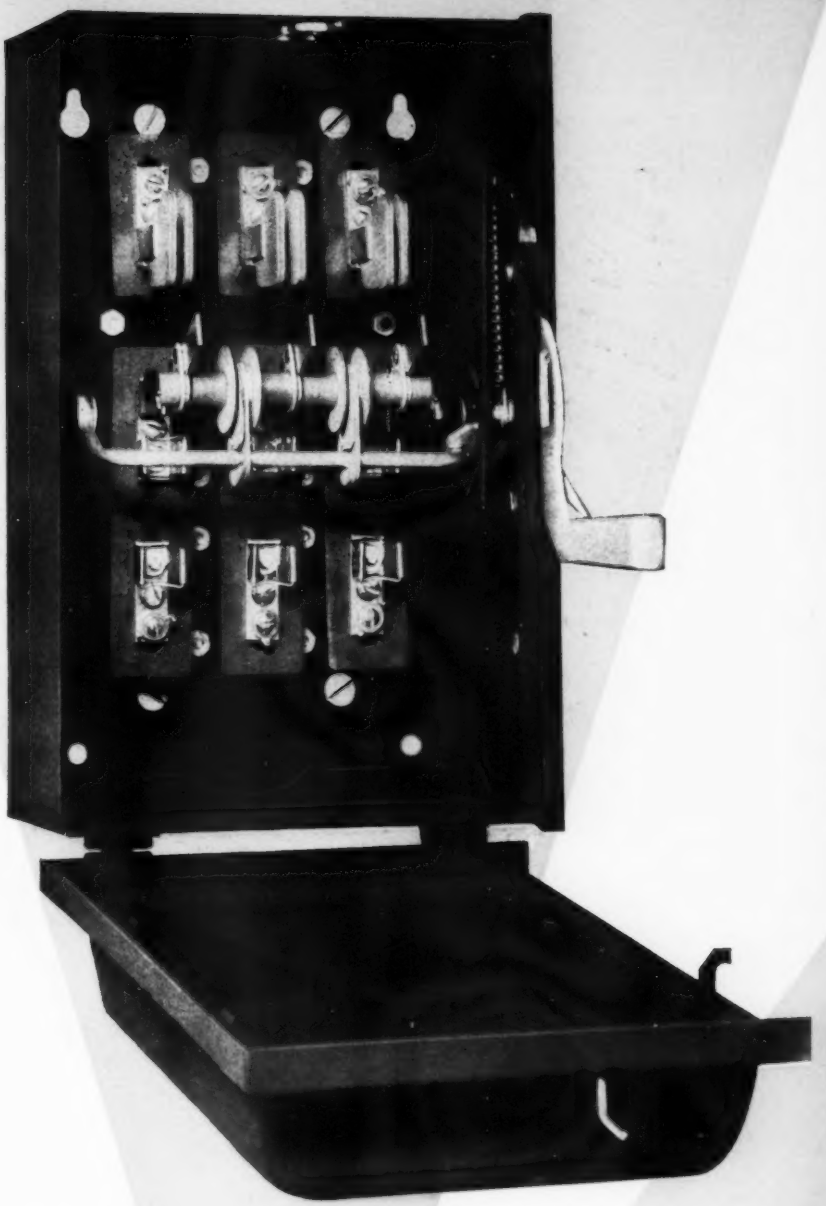

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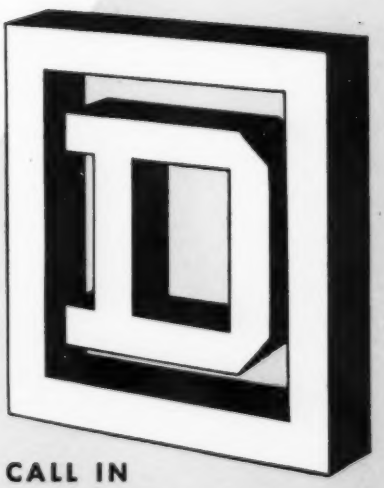

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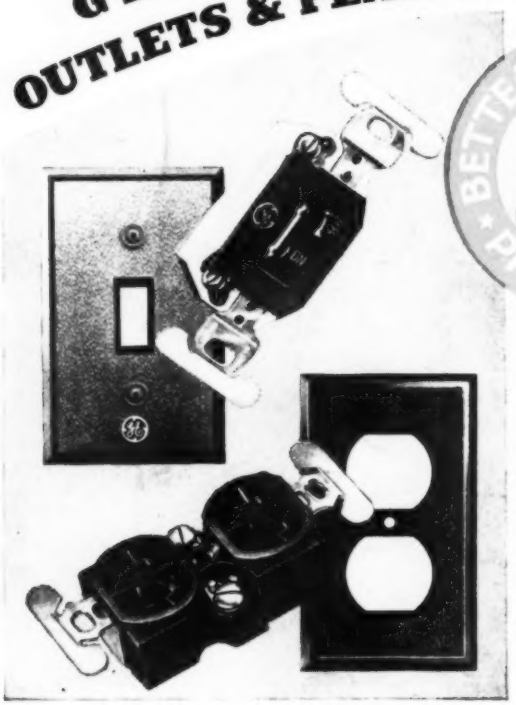

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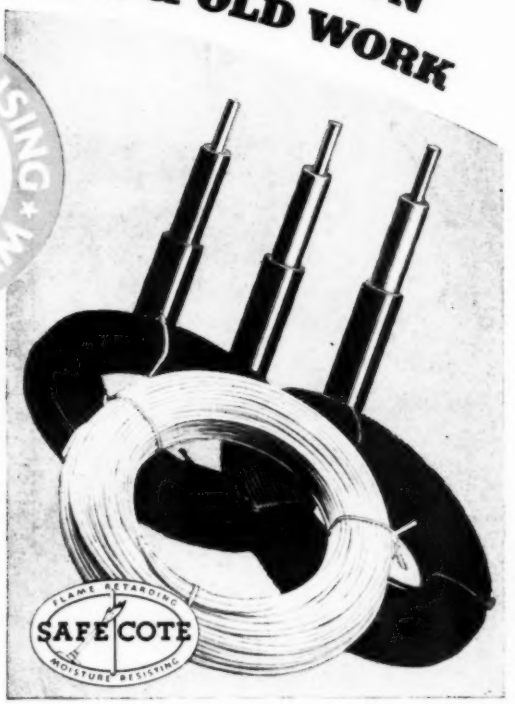


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